Natural History
vol. — 4
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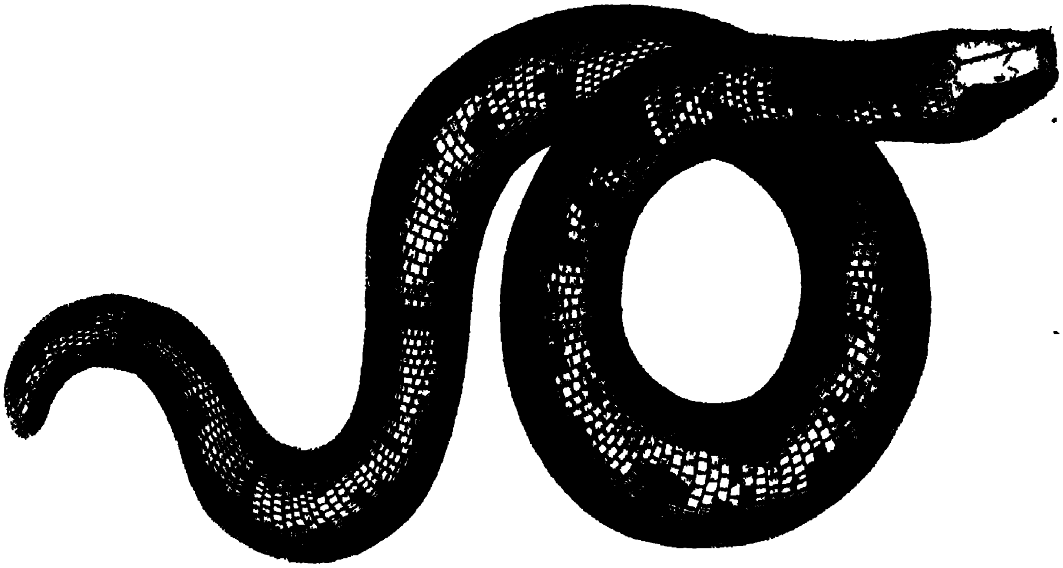
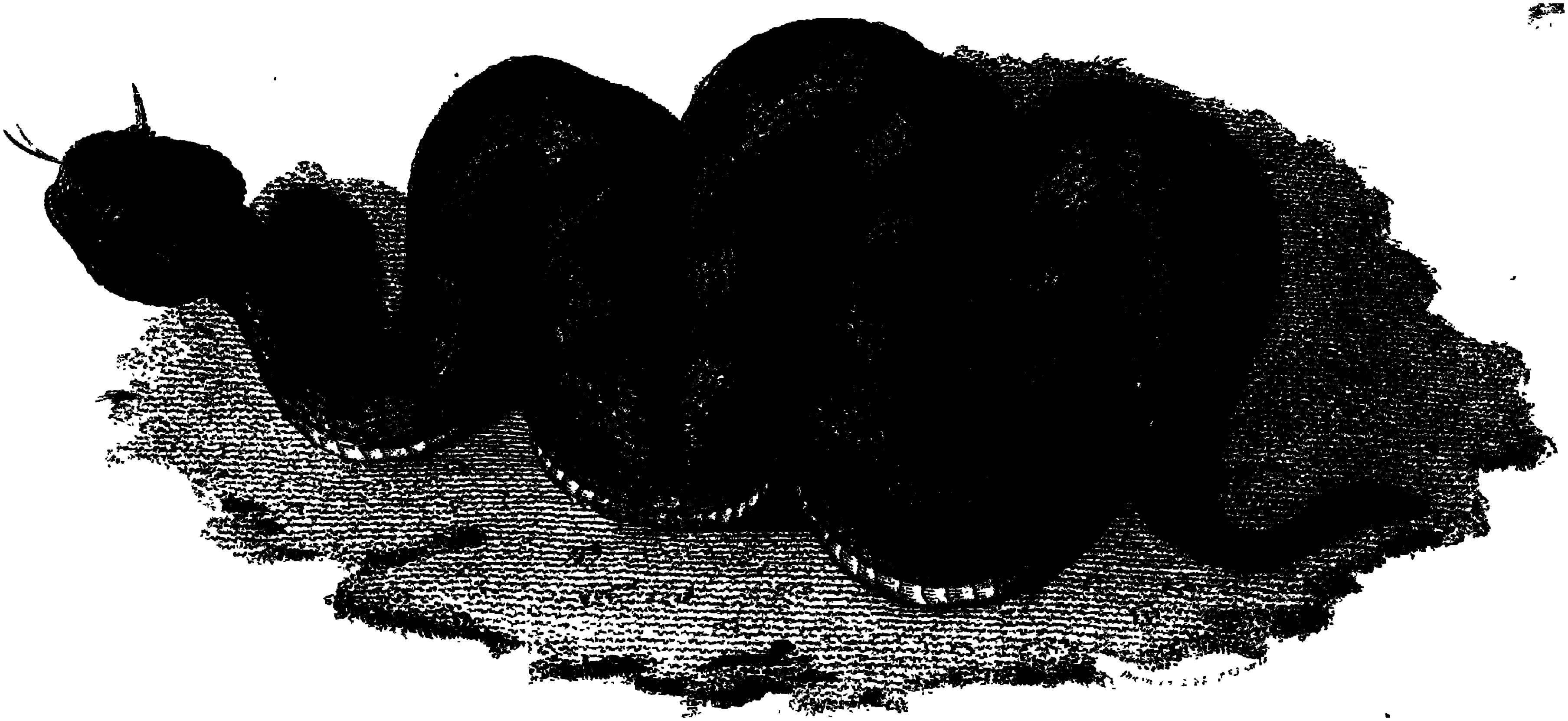


Amphisbæna

[illegible] of Java

NATURAL HISTORY.

Pl. XLVIII



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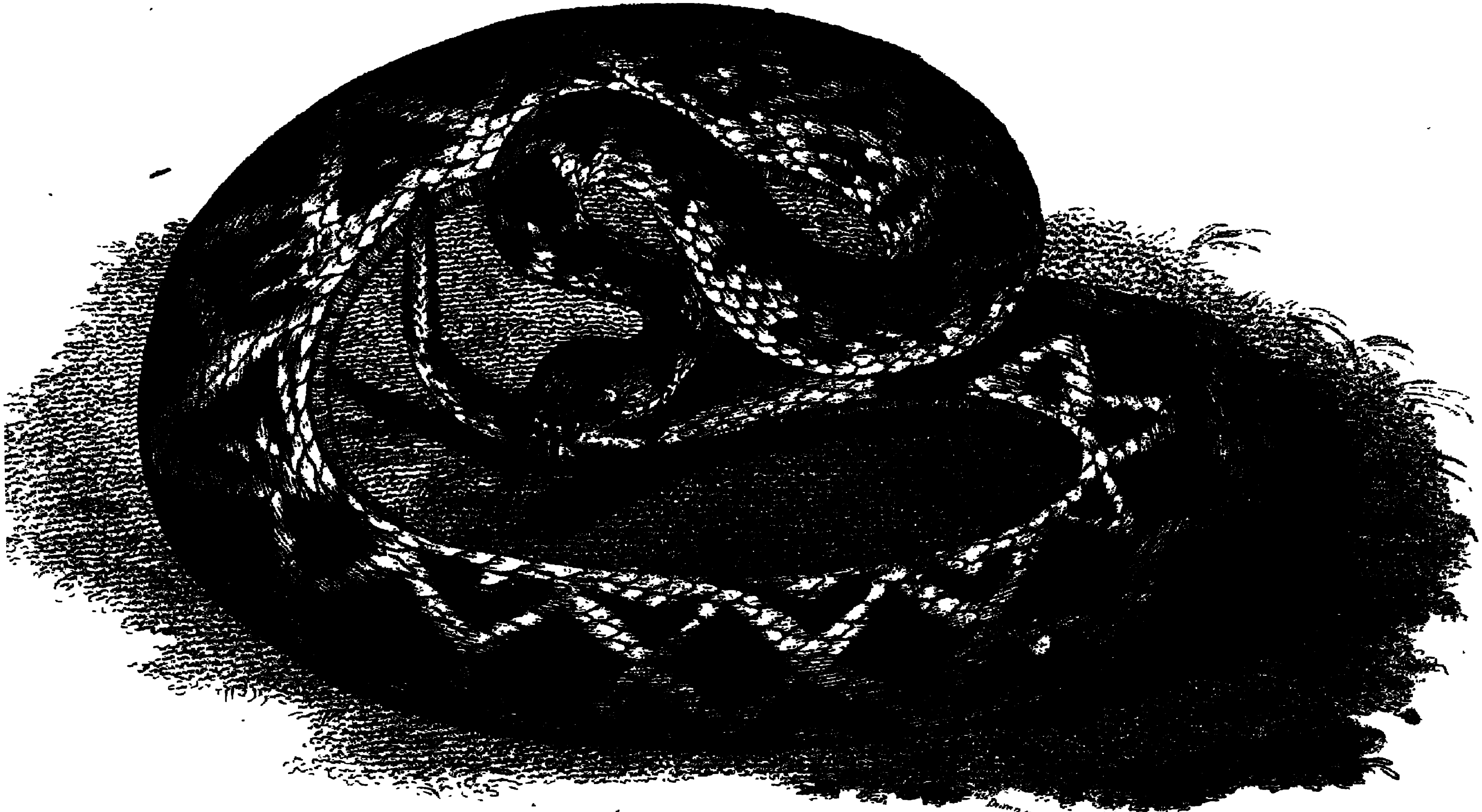
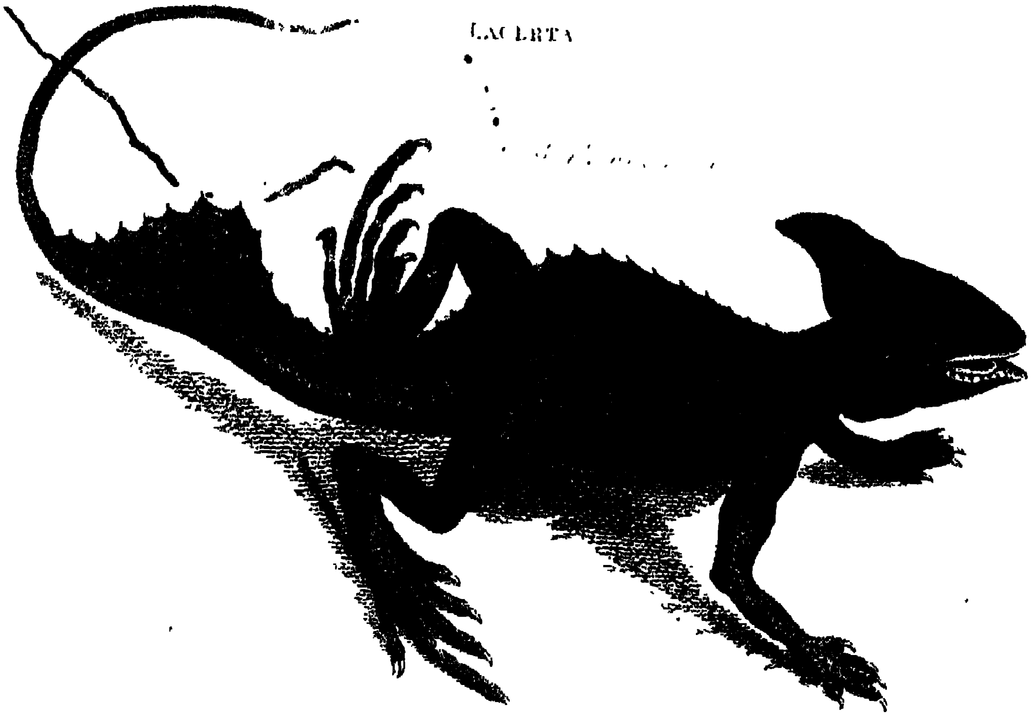
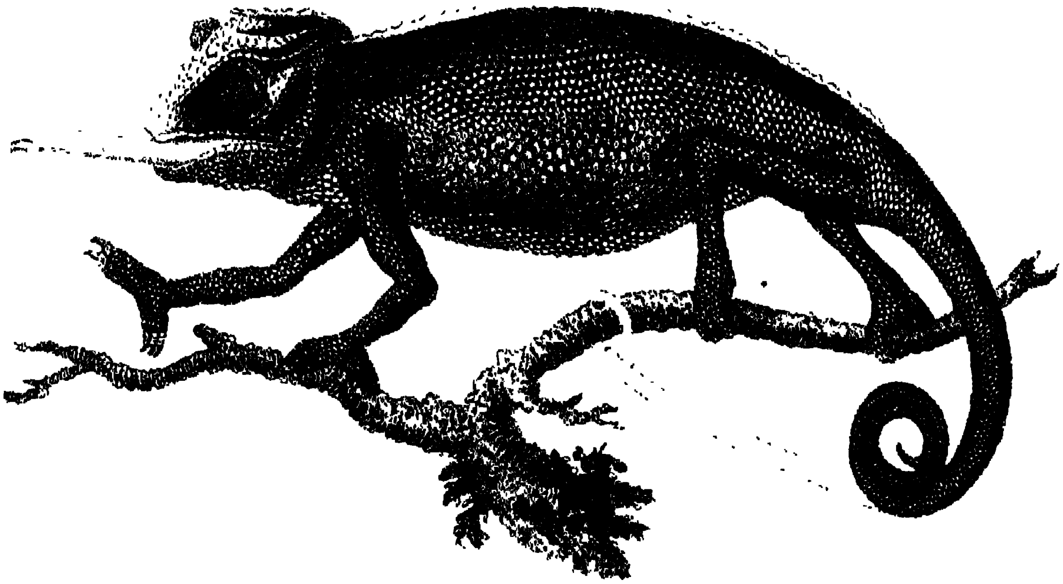


Striped Rattle Snake

NATURAL HISTORY.

LACERTA

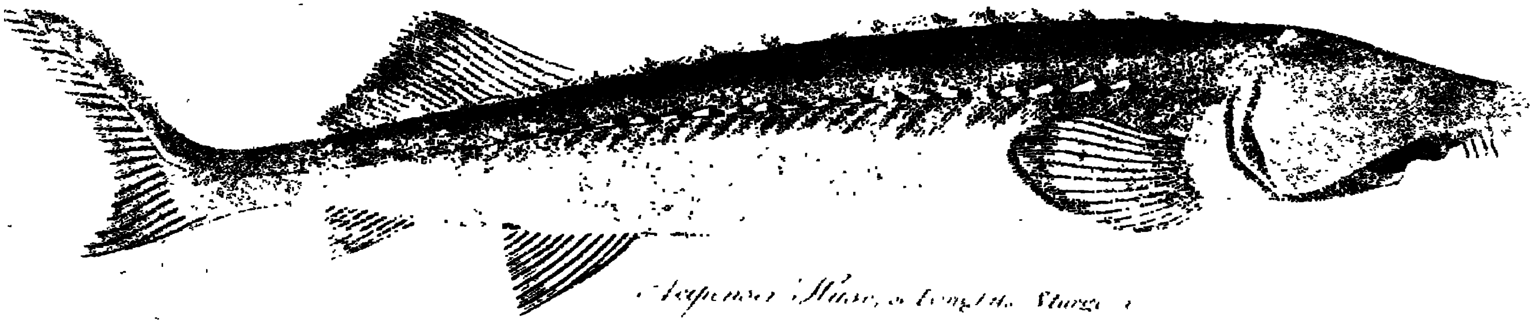




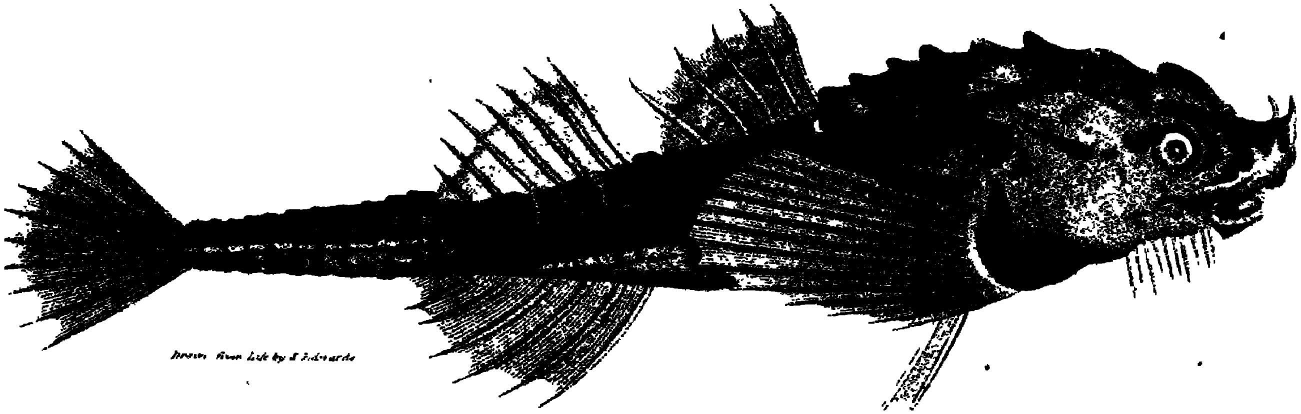
NATURAL HISTORY

LACERTA

NATURAL HISTORY.



Acipenser Huso, or Isinglass Sturgeon.

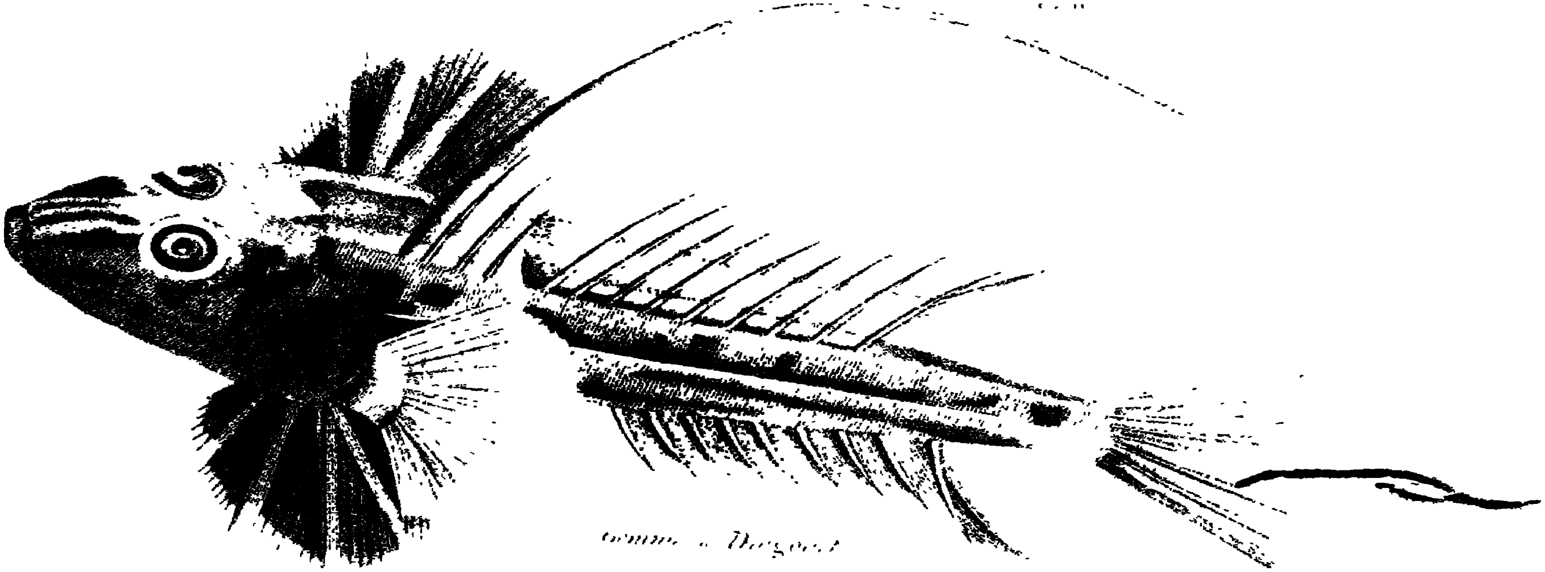


Drawn from Life by S. Edwards

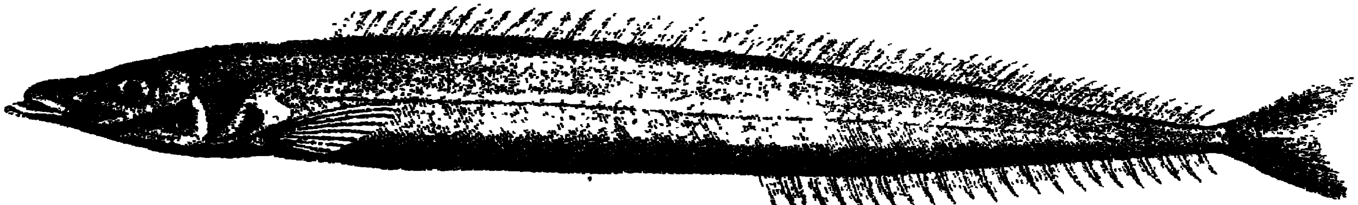
Cottus Cataphractus, Pogge or Armed Bull-head.

London Publish'd [illegible]

NATURAL HISTORY,



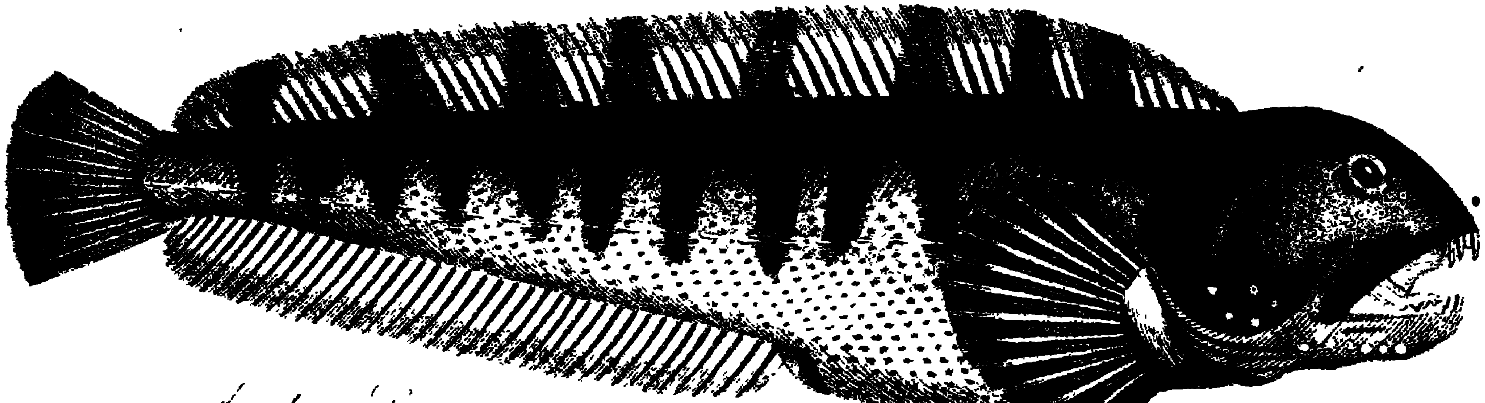
Gemmeous Dragonet



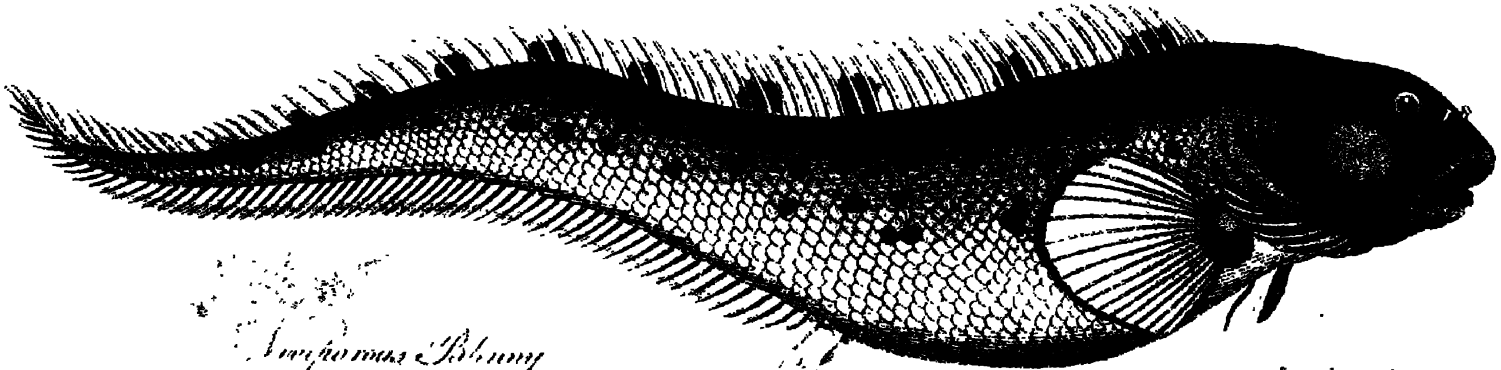
Drawn from Life by [illegible]

Ammodytes Tobianus, or Sand Launce

London, Published by [illegible] Fleet Street [illegible]



Anarhicas Lupus, or Common Wolf Fish



Viviparous Blenny

Drawn [illegible] by A. C. Edwards

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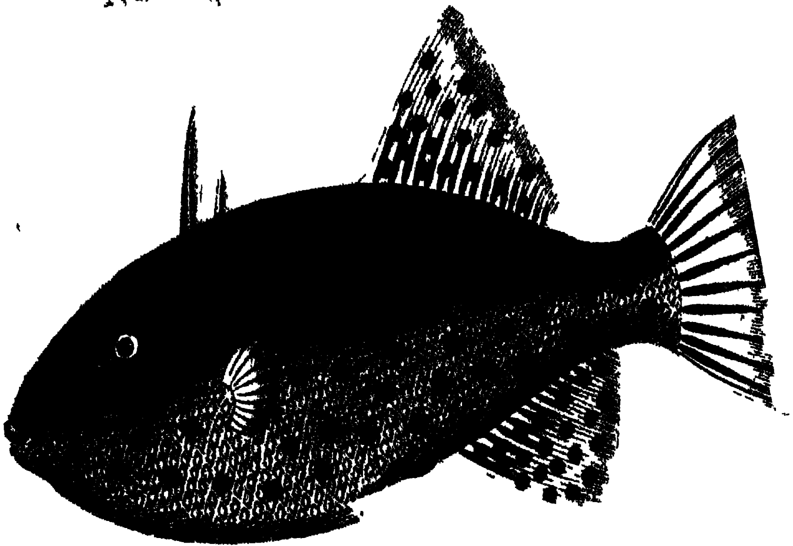
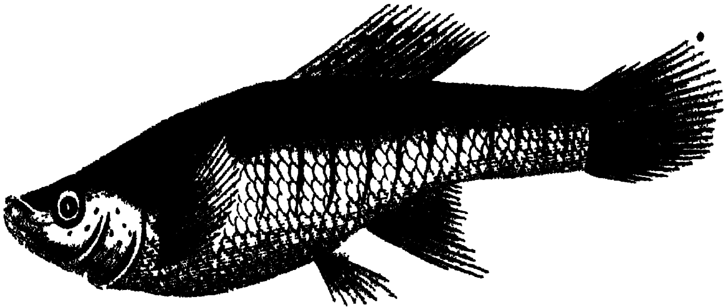
NATURAL HISTORY.

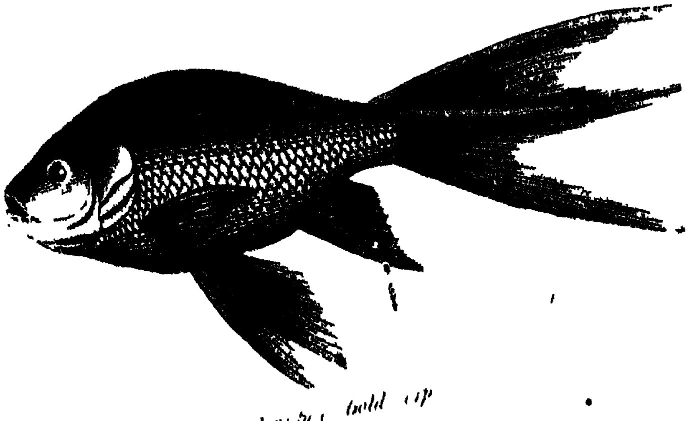
Pl. XXIV



Spotted File Fish



Banded Alburne or Silver Fish



Variety of Gold Carp

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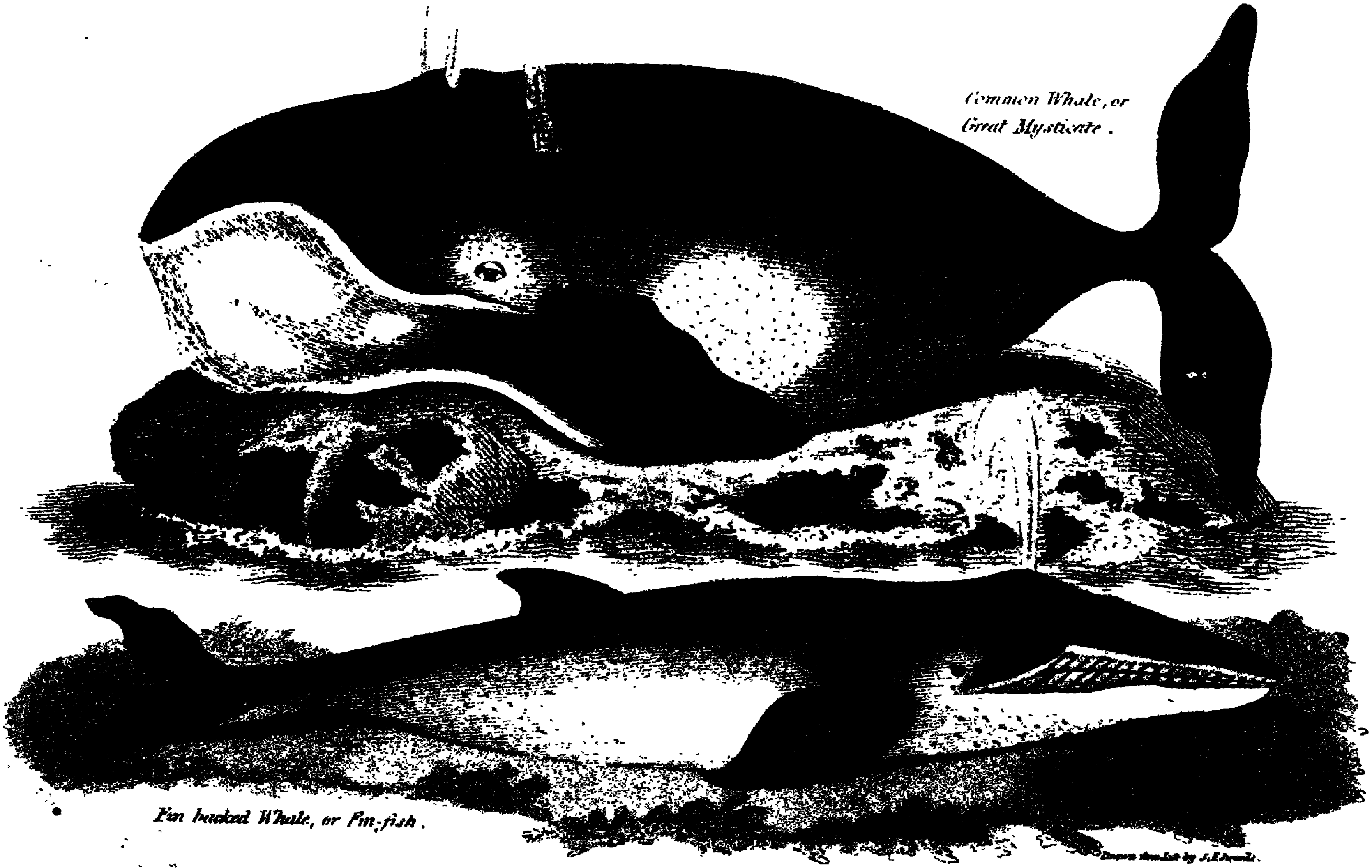


Common Whale, or
Great Mysticete.

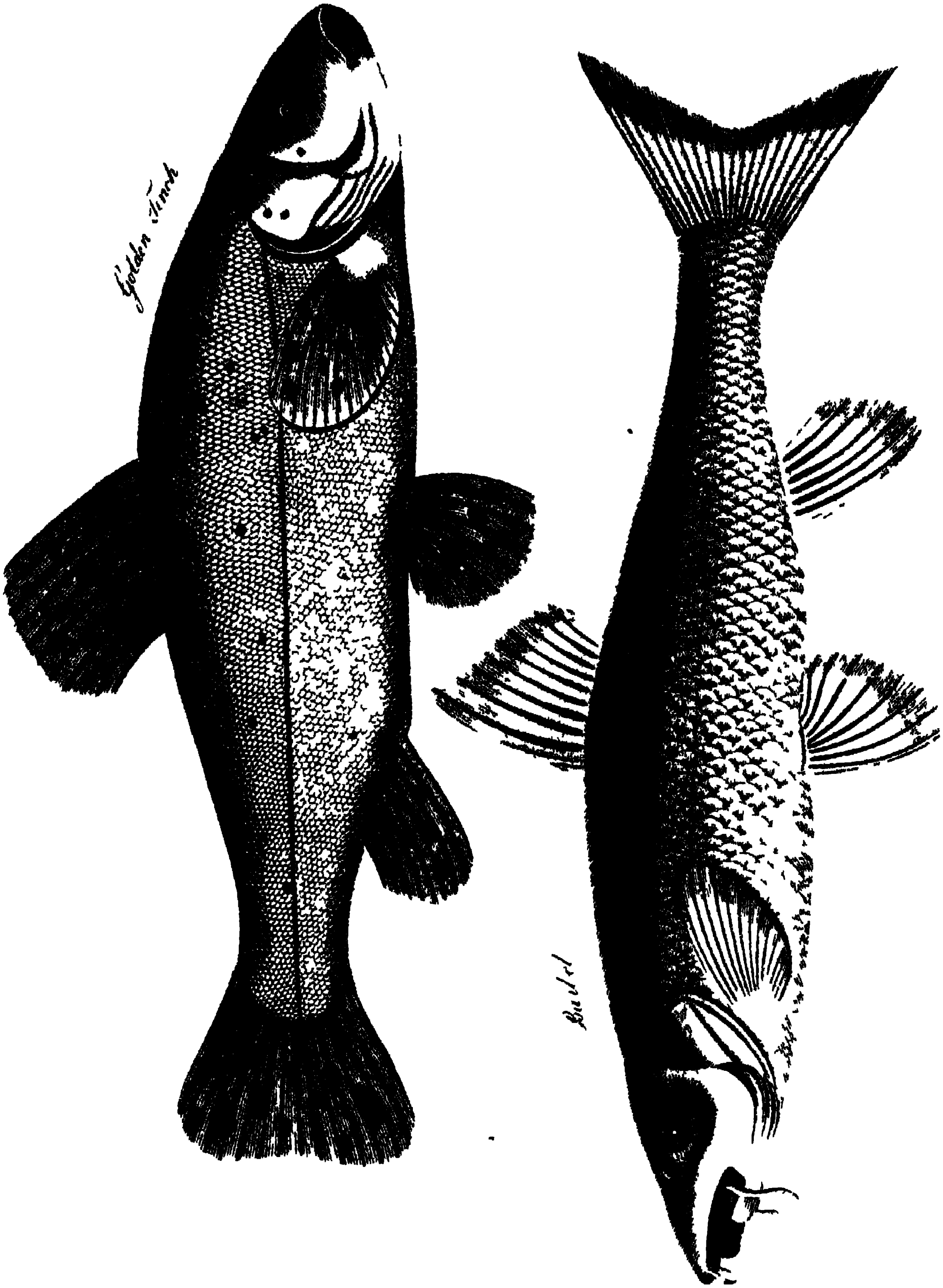
Fin backed Whale, or Fin-fish.

Drawn from Life by S. Edwards.

London Published by Geo. Kearsley, Fleet Street, Feb. 1, [illegible].

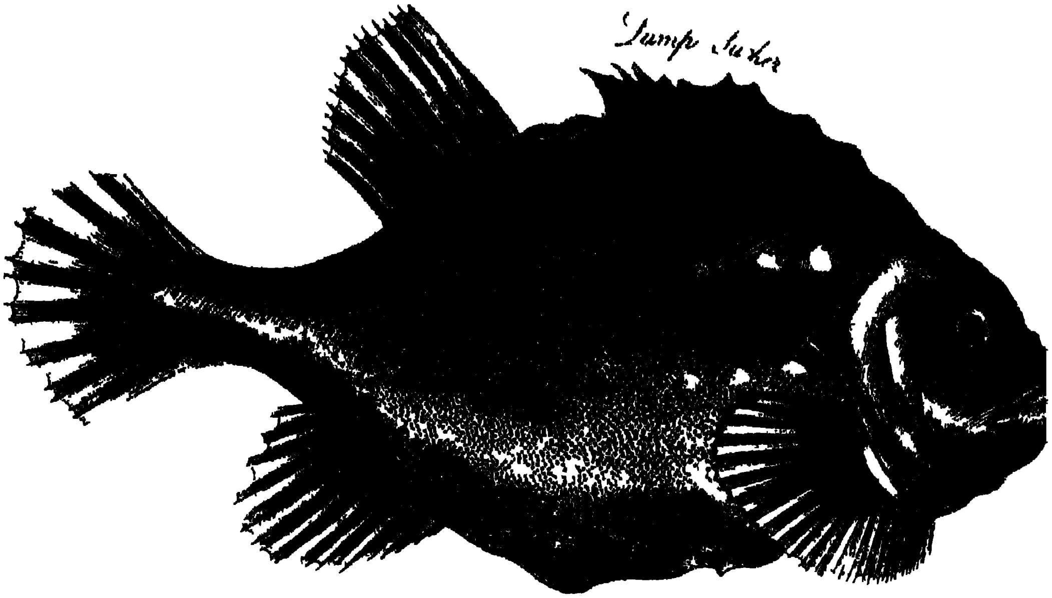
NATURAL HISTORY.

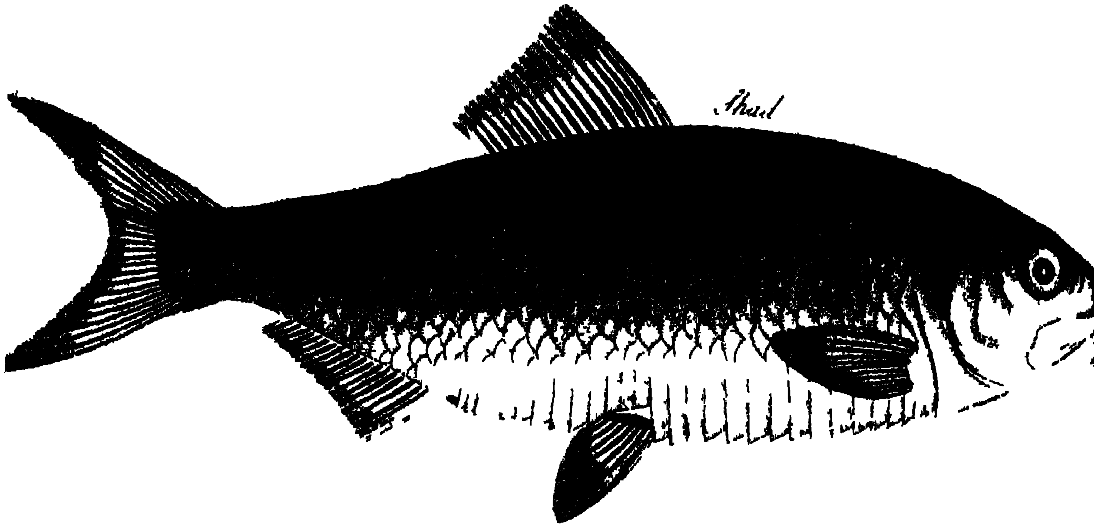
Pl. XXVI

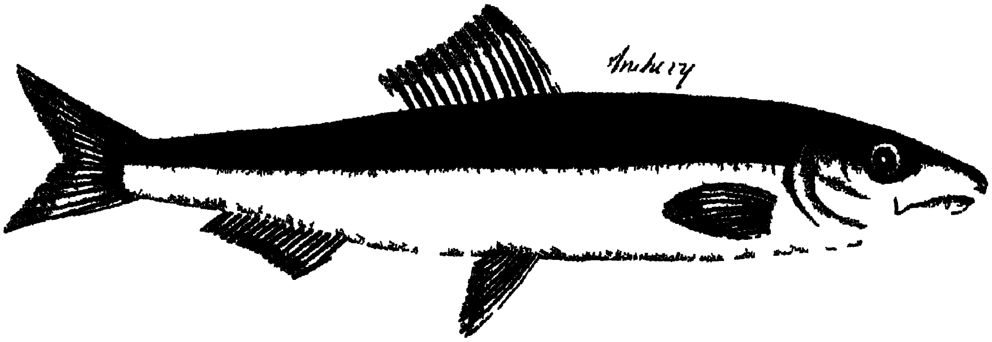


London. Published by G. Kearsley Fleet Street Sept.r 1 1808

NATURAL HISTORY.



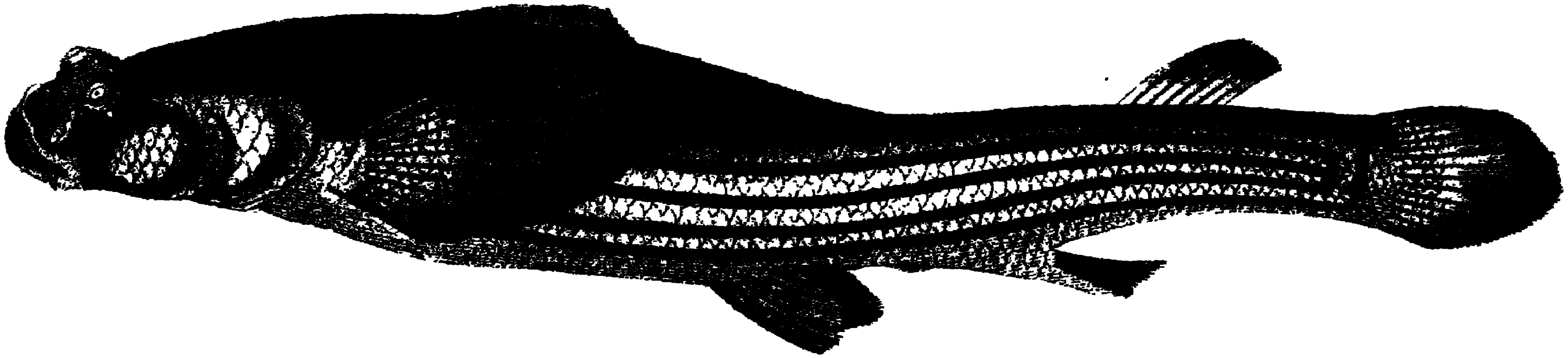




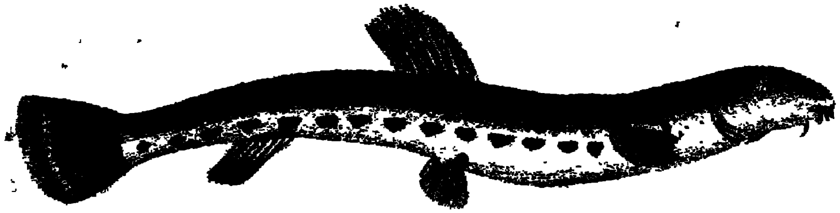
London Published by G. Kearsley Fleet Street [illegible]

NATURAL HISTORY.

Pl. 133



Four-eyed Anableps



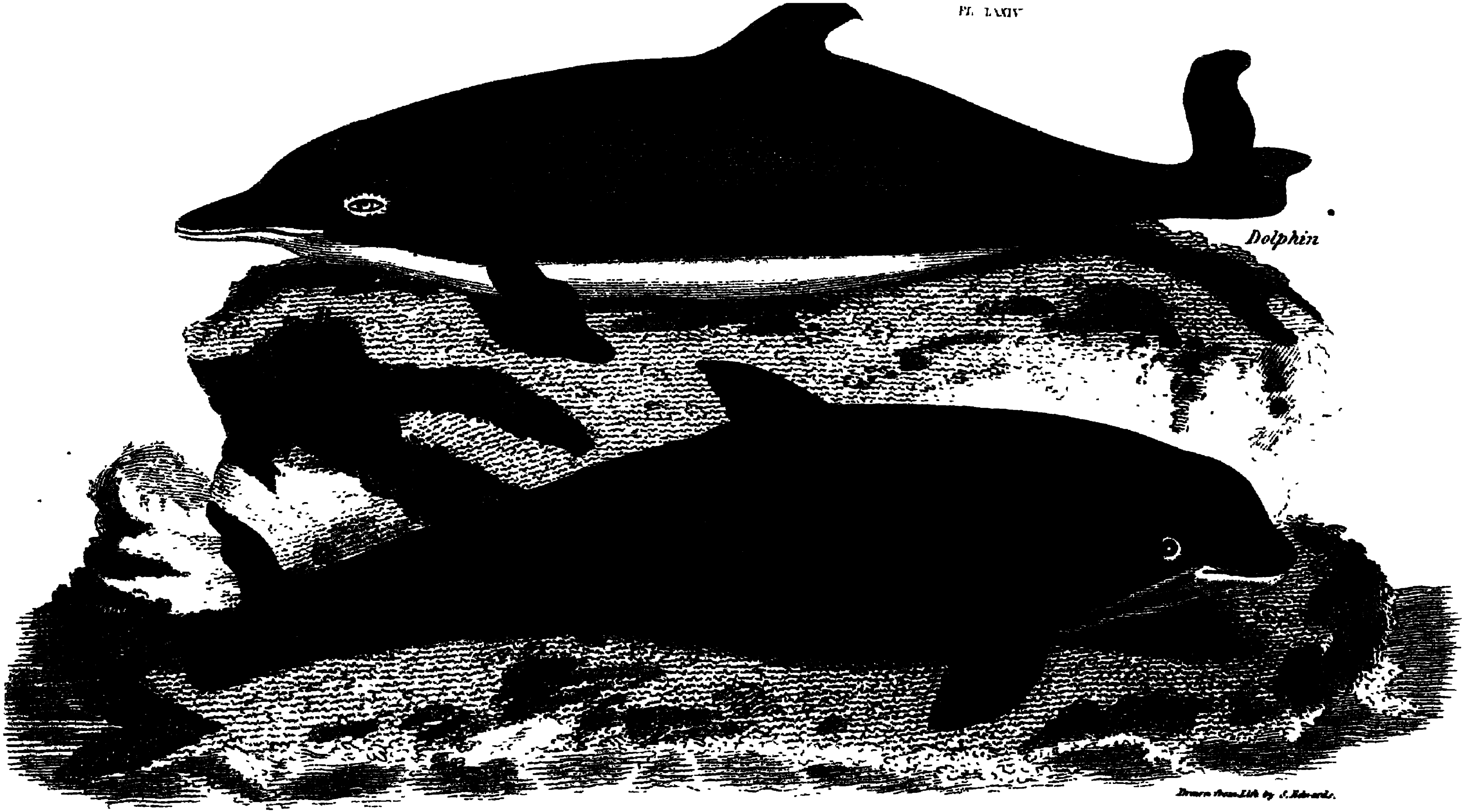
Spiny Loche.

Mailed Centriscus

Drawn & Engraved by [illegible]

London Published by [illegible] Kearsley Fleet Street [illegible]

PL. LXIV.

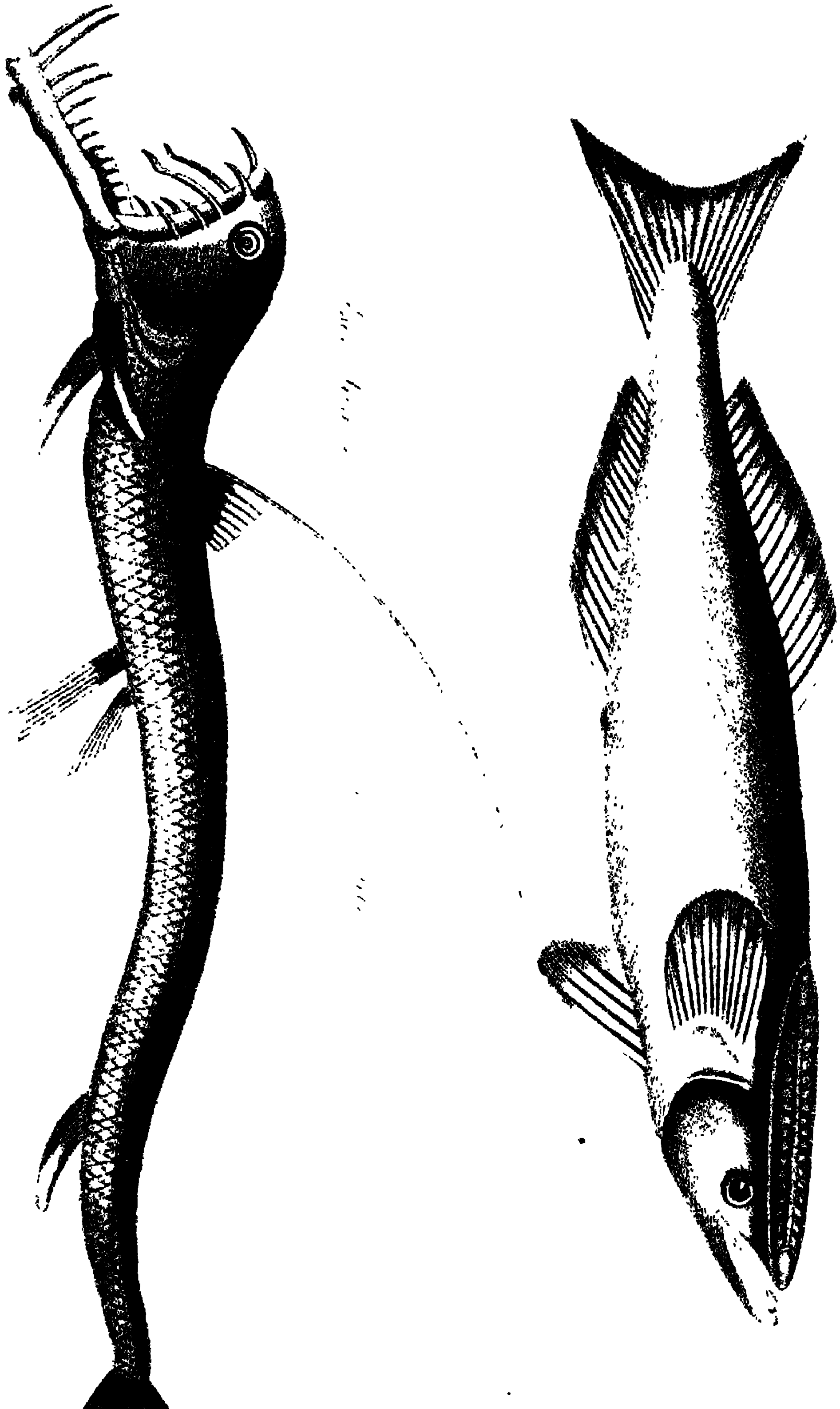


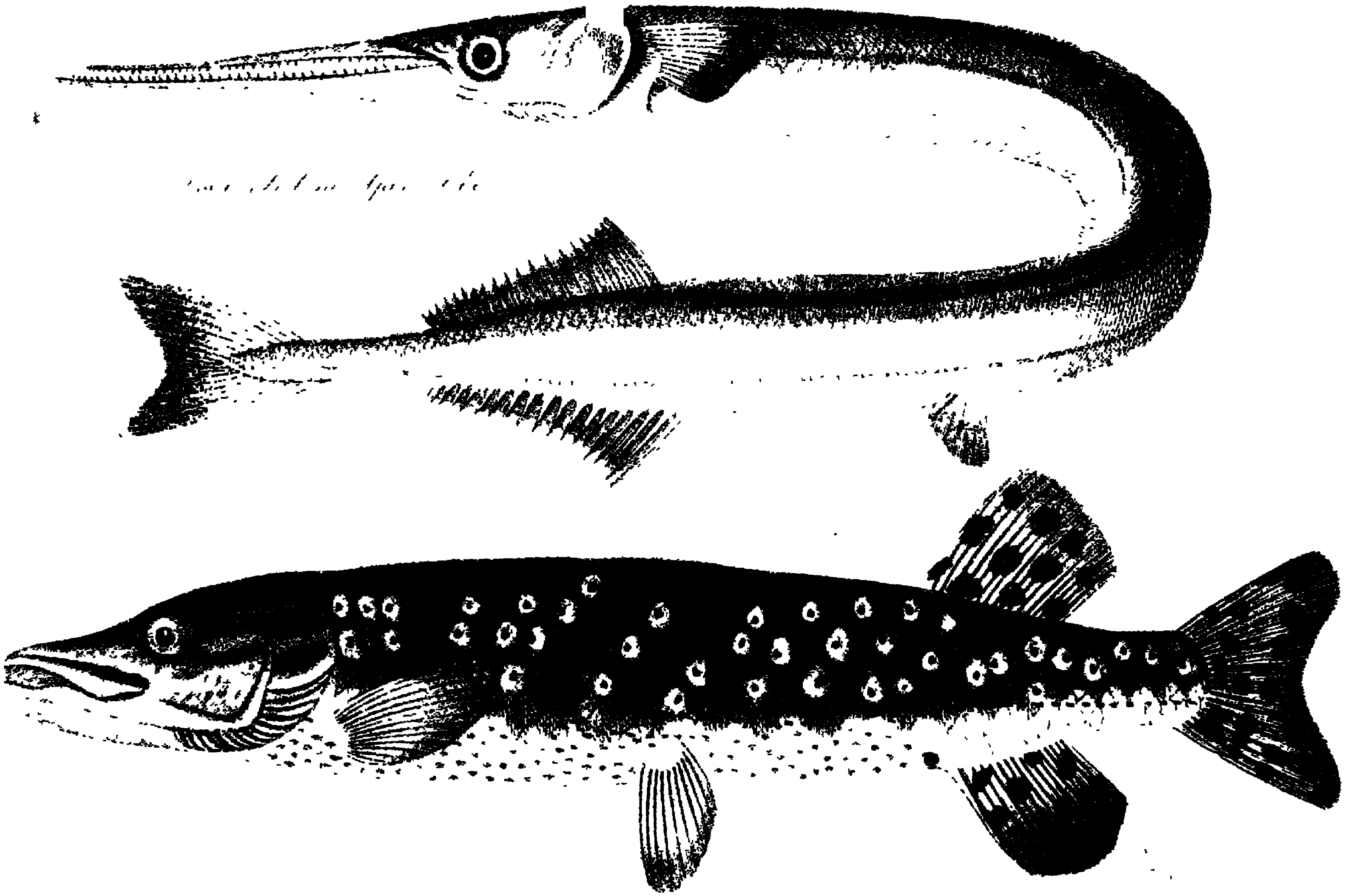
Dolphin

Drawn from Life by S. Edwards.

Porpesse, or Porpoise

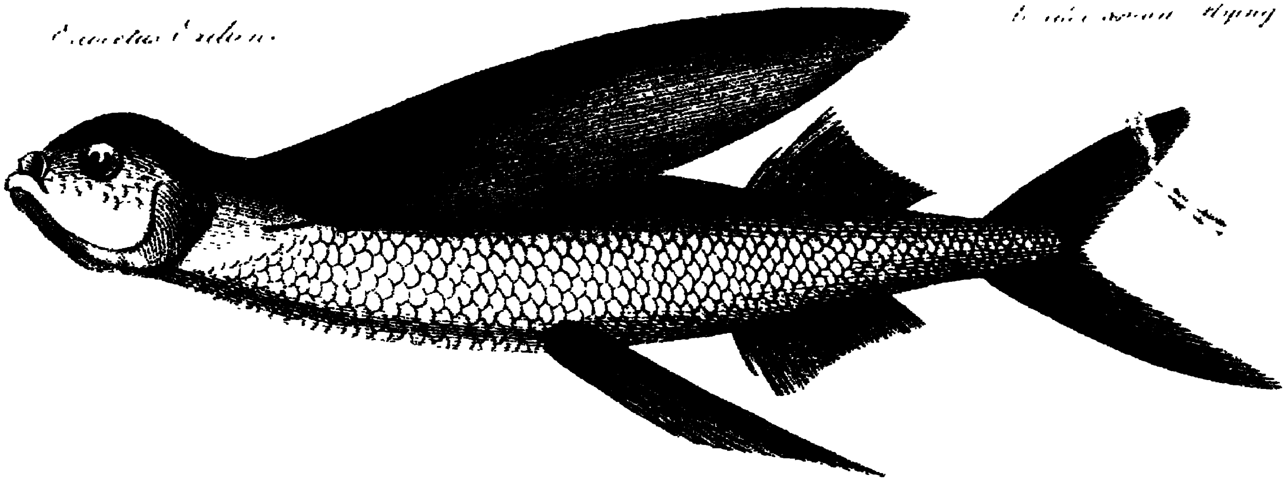
London, Publish'd by Geo. Kearsley, Fleet Street, Feb. 1. 18

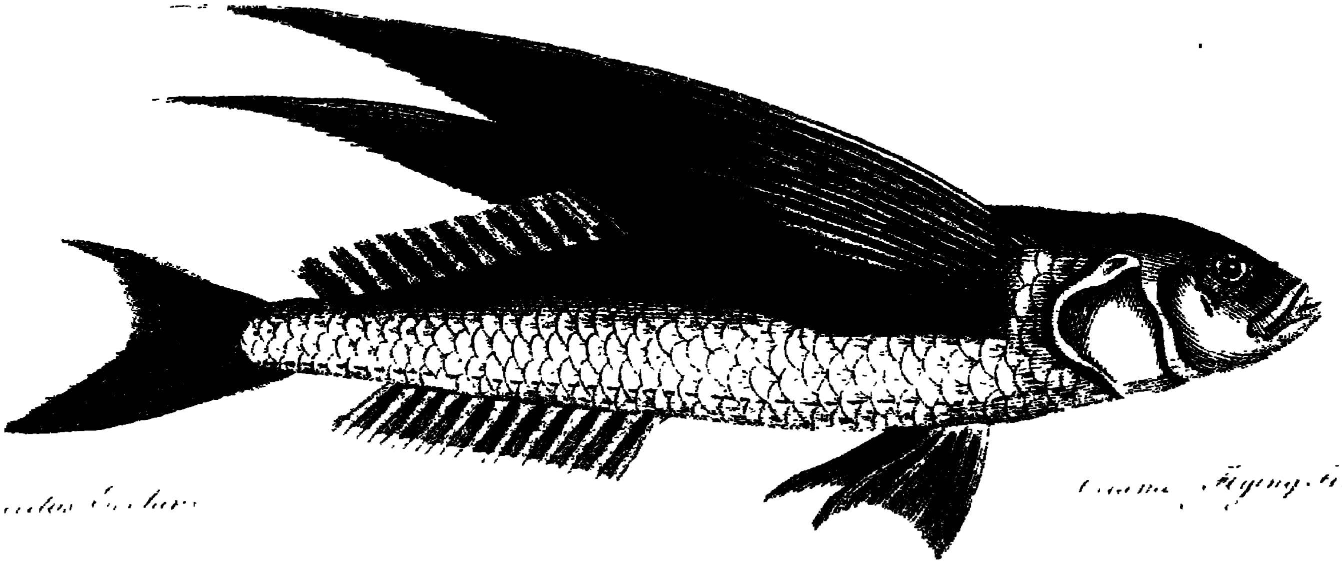




Exocoetus Exiliens.

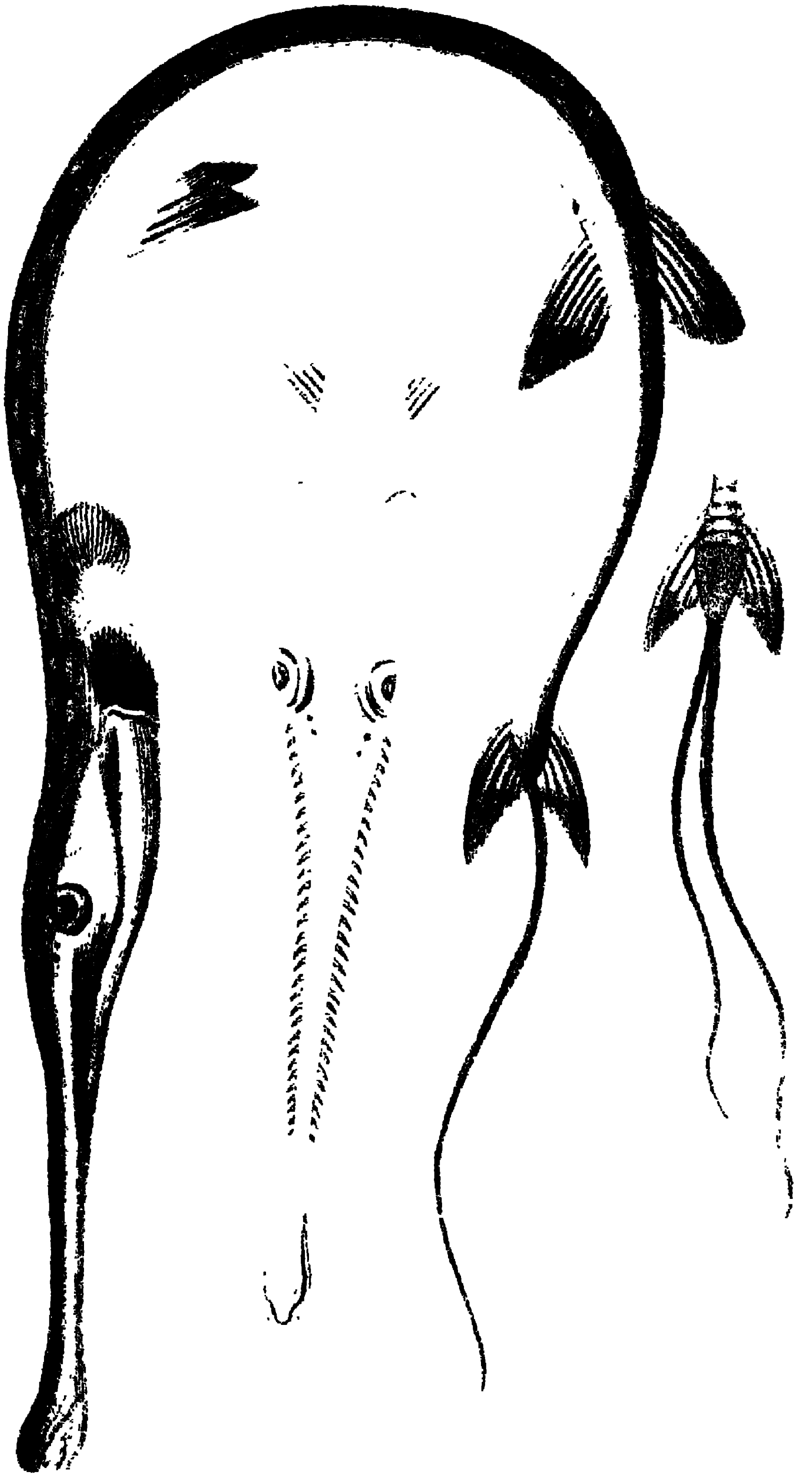
Mediterranean Flying Fish.

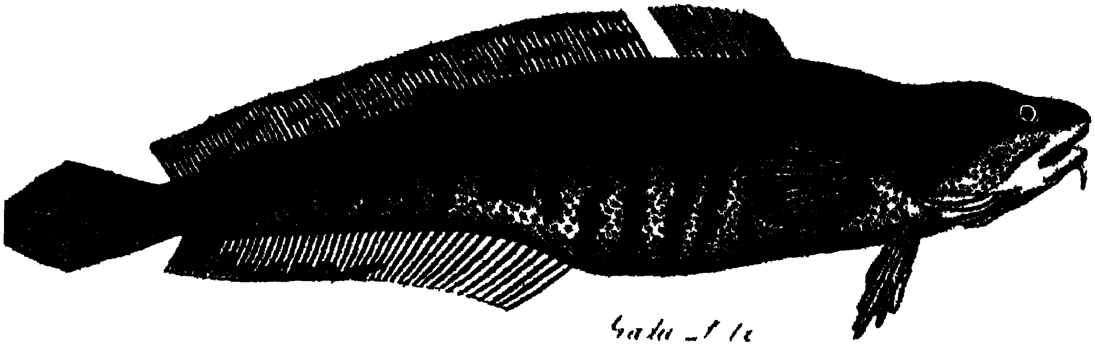




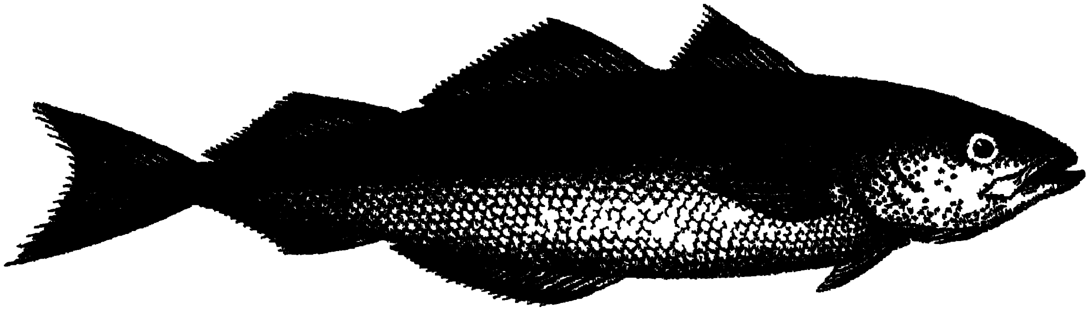
Exocoetus Evolans.

Common Flying Fish.

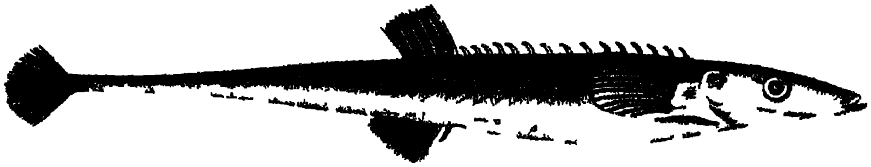




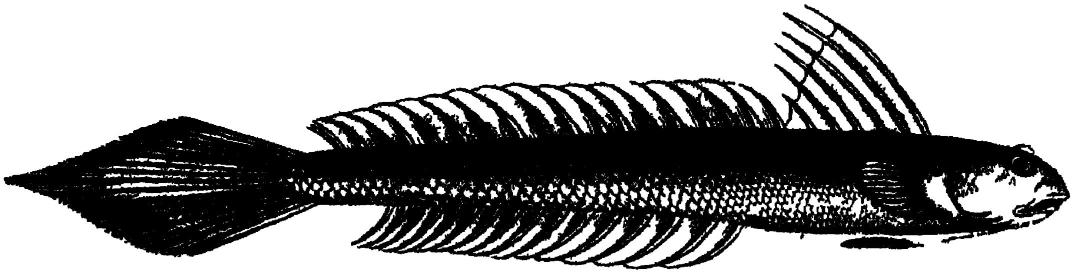
Gadus Lota
or Burbot



Gadus Callarias
or Codfish



Gasterosteus Spinachia
Fifteen Spined Stickleback



Gobius Lanceolatus
or Lance tailed Goby

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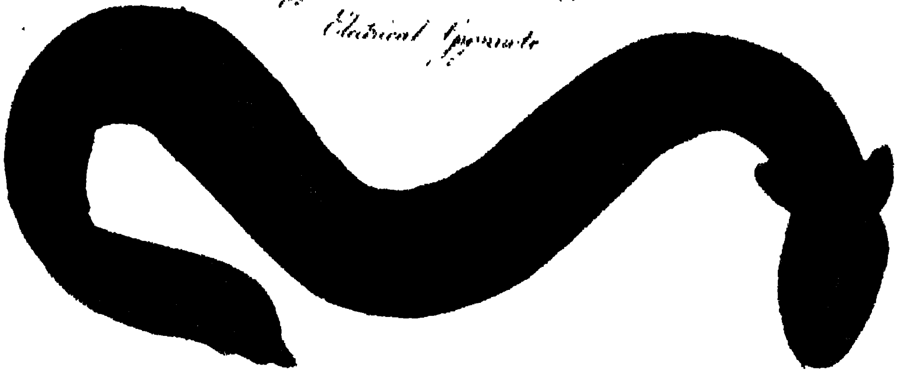
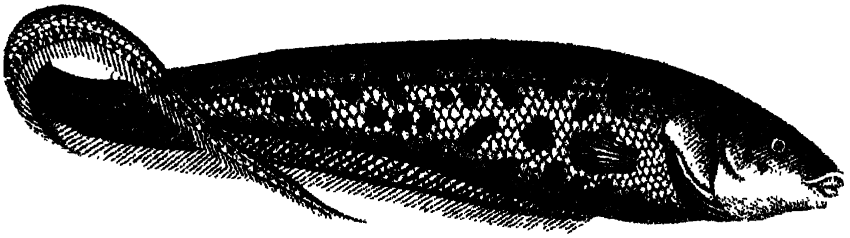
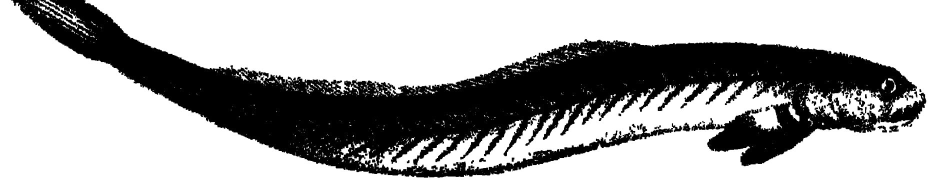
London, Published by G. Kearsley Fleet Street [illegible]



Gymnotus Electricus, or
Electrical Gymnote



Carap Gymnote



Cepedian Gymnotus

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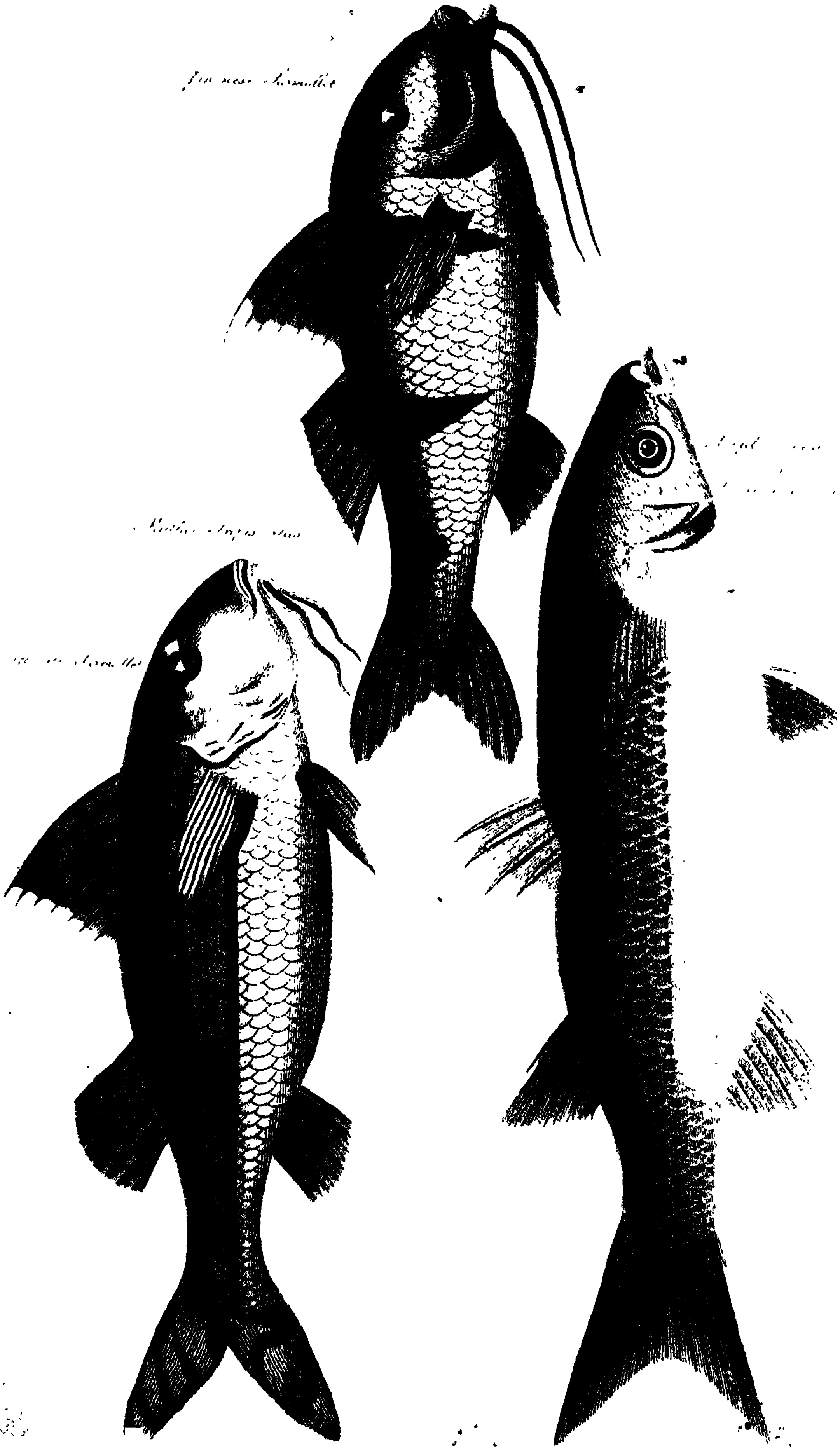

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PANTOLOGIA.

D.

D, The fourth letter of the alphabet, and the third consonant, having a kind of middle sound between *t*, and *th*; its sound is formed by a stronger impulse of the tongue to the upper part of the mouth, than is necessary in the pronunciation of the *t*. Grammarians generally reckon D among the lingual letters, as supposing the tongue to have the principal share in the pronunciation thereof; though the Abbot de Dangeau makes it a palate letter. The letter D is the fourth in the Hebrew, Chaldee, Samaritan, Syriac, Greek, and Latin alphabets; in the first five of which languages it has the same name, though somewhat differently spoken, *e. g.* in Hebrew, Samaritan, and Chaldee *Daleth*, in Syriac *Doleth*, and in Greek *Delta*.

The form of our D is the same with that of the Latins, as appears from all the ancient medals and inscriptions; and the Latin D is no other than the Greek Δ, rounded a little, by making it quicker and at two strokes.

Some learned Greek scholars pronounce the *tau* as a *delta* after the ν, and pronounce πάντα, as if it were written πάνδα; which may be an acceptable softening in the pronunciation, though it is not a fault to say otherwise. In the Latin tongue the D and the T have a great affinity, and are often changed one for another, as *at* for *ad*. And Quintilian laughs at those who scruple to write indifferently, one for the other, *set* for *sed*, *haut* for *haud*, and others, to be seen in ancient inscriptions.

D is also a numeral letter, signifying five hundred; which arises hence, that, in the Gothic characters, the D is half the M, which signifies a thousand. Hence the verse, "*Litera D velut A quingentos significabit.*" A dash added a-top $\bar{D}$, denotes it to stand for five thousand.

Used as an abbreviation, it has various significations: thus D stands for Doctor; as, M. D. for Doctor of Medicine; D. T. Doctor of Theology; D. D. implies Doctor of Divinity, or "dono dedit;" D. D. D. is used for "dat, dicat, dedicat;" and D. D. D. D. for "dignum Deo donum dedit."

D, in music, is the nominal of that note to which Guido applied the monosyllable *re*. D C. is often set for Da Capo.

DA, Del, or Di, in music, signifies *for* or *by*: as *da camera*, for the chamber.

To DAB. *v. a.* (*dauber*, French.) To strike gently with something soft or moist (*Shakspeare*.

Dab. *s.* (from the verb.) 1. A small lump of any thing. 2. A blow with something moist or soft. 3. Something moist or slimy thrown upon one. 4. (In low language.) An artist. 5. In ichthyology. See Pleuronectes.

Dab-chick, a small waterfowl.

DABAL, or Dabul, a town on the coast of Malabar, in the East Indies. Its trade consists of pepper and salt. It belongs to the Portuguese. Lat. 17. 32 N. Lon. 72. 50 E.

To DA'BBLE. *v. a.* (*dabbelen*, Dutch.) To smear; to daub; to wet (*Swift*).

To Da'bble. *v. n.* 1. To play in water; to move in water or mud (*Swift*). 2. To do any thing in a slight, superficial, or shallow manner; to tamper (*Pope*).

DA'BBLER. *s.* (from *dabble*.) 1. One that plays in water. 2. One that meddles without mastery; a superficial meddler (*Swift*).

DACCA, a town of Asia, in the kingdom of Bengal, in the East Indies. Lat. 23. 50 N. Lon. 85. 30 E.

DACE, in ichthyology. See Cyprinus.

Dace fishing. Dace, dare and roach,

are much the same kind of fishes, in manner of feeding, cunning, size and taste.

The haunts of dace are gravelly, sandy, and clayey bottoms; deep holes that are shaded; water-lily leaves, and the foam caused by an eddy: in hot weather they are to be found on the shallow, and are then best taken with an artificial fly, grasshoppers, or gentles.

Dace spawn about the latter end of March, and are in season about three weeks after; they are not very good till about Michaelmas, and are best in February.

Baits for dace are the oak-worm, red-worm, brandling, gilt-tail, and indeed any worm bred on trees or bushes, that is not too large for his mouth: almost all kinds of flies and caterpillars.

Though dace are as often caught with a float as roach, yet they are not so properly float fishes; for they are to be taken with an artificial gnat, or ant-fly, or indeed almost any other small fly in its season: but in the Thames, above Richmond, the largest are caught with a natural green dun grasshopper, and sometimes with gentles; with both which you are to fish, as with an artificial fly; they are not to be come at till about September, when the weeds begin to rot; but when you have found where they lie, which in a warm day is generally on the shallow, it is incredible what havock you may make; pinch off the first joint of the grasshopper's legs, put the point of the hook in at the head, and bring it out at the tail. And in this way likewise you catch chub, especially if you throw under the boughs.

Fish for roach within six, and for dace within three inches near the bottom.

They will bite at any fly, but especially at the stone caddis, or day fly, the latter end of April, and most part of May: it is an excellent bait, floating at top of the water, and of which you may gather great quantities from the reeds and sedge by the water side: or from hawthorn bushes that grow near the bank of a shallow gravel stream, upon which they greatly delight to hang. They will also bite at ant-flies, of which the blackest are the best, found in mole-hills, June, July, August, and September; which you may preserve for your use, by putting them alive into a glass bottle, having first put into it some of the moist earth whence you gathered them, with some of the roots of the grass of the same hillocks, laying a clod of earth over the bottle: but if you would preserve them above a month, put them into a large runnet, which has been first washed with water and honey on the inside, and then you may retain them three months: yet the best time to make use of them is when they swarm, which is generally about the latter end of July, and the beginning of August.

This sort of fish, in a warm day, rarely refuses a fly at the top of the water; but when you fish under water for him, it is best to be within a handful, or sometimes more, of the ground.

If you would find dace or dare in winter, then, about All-hallow-tide, wherever you see *heaths, or sandy grounds ploughing up, follow the plough, and you will find beetle grubs in* the form of a white worm, with a red head, as big as the top of a man's little finger and very soft; gather these, and put them into a vessel, with some of the earth whence they were taken, and you may keep them all the winter for an excellent bait.

DACI, in antiquity, the people of Dacia.

DACIA, the ancient name of two countries of Europe: the one on this side of the Danube, called Dacia Aureliana; the other called Dacia Trajani, on the other side of that river. According to M. D'Anville, Dacia was about thirteen hundred miles in circuit.

DACIER (Andrew), a learned Frenchman; born of protestant parents at Castres in Upper Languedoc, in 1651, and educated chiefly at Saumur under Tanaquil Faber, or Le Fevre, whose learned daughter he afterwards married. He published at Paris, in 1681, an edition of Pompeius Festus, for the use of the dauphin. His Horace, with a French version, came out the same year. In 1683 he married, and we do not find that he published any thing till 1691, when his translation of the Reflections of Marcus Antoninus appeared. The next year he published his translation of Aristotle's Poetics. From this time to his death he continued publishing some work or other every year. For his services to literature he was appointed perpetual secretary to the academy, rewarded with a pension of 2000 livres, and made keeper of the books in the king's closet. He died in 1722. Dacier and his wife renounced the protestant religion in 1685. Besides the works above mentioned he translated the works of Plato into French; the Lives of Plutarch; the Manual of Epictetus, &c. (*Watkins*).

DACIER (Anne), the wife of the preceding, and daughter of Le Fevre, professor of Greek at Saumur, where she was born in 1651. Her father discovering her turn for learning, indulged her wish, and gave her a most liberal education. In 1674 she published an edition of Callimachus, which gave so much satisfaction that she was employed to prepare editions of Latin authors for the use of the dauphin; accordingly she published Florus the same year. This book she sent to Christina queen of Sweden, who made her great offers if she would renounce the protestant religion, and reside at her court; but this she refused. In 1681 she published a translation of Anacreon and Sappho, which was followed by versions of some of Plautus's comedies, and of the Plutus and Clouds of Aristophanes. In 1683 she married M. Dacier, who joined with her in renouncing the protestant religion about two years afterwards. In 1688 she translated into French the comedies of Terence, with notes. In 1711 came out her translation of the Iliad; and in 1714 she defended Homer against M. de la Motte, in a book entitled, The Causes of the Corruption of Taste; this was followed in 1716 by another against father Hardouin. The same year came out her version of the Odyssey, *which closed her literary labours. She died in 1720. She had two daughters and a son. One of the daughters became a nun, the other died* at the age of 18, and the son when he was a child. Madame Dacier was as remarkable for her modesty as for her erudition. A learned German having paid her a visit, begged that she would write her name and a sentence in his book. She excused herself as long as she could, but being strongly importuned she complied, and added to her signature a verse from Sophocles, importing that silence is the ornament of the female sex. (*Watkins*).

DACRYON. See TEARS.

DACTYL. (δακτυλος, *dactylus*.) In ancient poetry, a metrical foot, consisting of one long and two short syllables, as αλκιμος, and cāndĭdŭs. The dactyle and spondee are the only feet or measure used in hexameter verses, the former being esteemed more sprightly, and the latter more solemn and grave. Accordingly, where great activity is signified, we find the dactyls used with much propriety, as in the following verses of Virgil:

Quadrupedante putrem sonitu quatit ungula
campum;

and,

Ferte cito ferrum, date tela, scandite muros.

DACTYLI, in antiquity, a name given to the first priests of Cybele. The word is derived from δακτυλος, *finger*; because their number was then equal to that of the fingers, i. e. ten. These dactyli are generally said, by ancient authors, to be the first who wrought in iron. But respecting them, or the dactyli idæi, as they were often called, the accounts of the ancients differ very widely.

DACTYLIOMANCY, a sort of divination performed by means of a ring. The ring was suspended by a fine thread over a round table, on the edge of which were marked the letters of the alphabet: such of these letters as the ring passed over in vibrating were joined together, and composed the required answer.

DACTYLIS. Cocho-foot-grass. In botany, a genus of the class triandria, order digynia. Calyx two-valved, compressed; one of the valves larger and carinate. Fourteen species; scattered over the globe; of which d. stricta and d. glomerata are common to our own country; the former to our sea-marshes, the latter to our meadows. This last, though eaten with relish by horses, sheep, and goats, is refused by cows.

DACTYLONOMY. (from δακτυλος, finger, and νομος, law.) The art of numbering, or accounting, by the fingers. There is every reason to conclude that dactylonomy was the original mode of computation.

DACTYLUS. (*dactylus*, δακτυλος, a finger: so called from the likeness of its fruit to a finger.) Rough and adstringent; but when perfectly matured, they are much of the nature of the fig. (See CARICA). Senegal dates are most esteemed, they having a more sugary, agreeable flavour, than those of Ægypt and other places.

DAD. DA'DDY. s. The child's way of expressing father (Shakspeare).

To DADE. *v. a.* To hold up by a leading string (*Drayton*).

DADO, in architecture, the cubical part in the middle of a pedestal between its base and corniche.

DADUCHI. (δαδυχοι, q. d. torch-bearers, priests of Ceres.) Their manner is, at the feasts of this goddess, to run about the temple, with lighted torches, in imitation of Ceres, who, as they relate, sought thus for Proserpine: from this custom arose the name. Among the Athenians, the high-priest of Hercules was also called daduchus.

DÆDAL LEAF, in botany, a leaf at the same time flexuose and lacerated; or winding and torn.

DÆDALA, a mountain and city of Lycia, where Dædalus was buried, according to Pliny. Also two festivals in Bœotia, so called; one of them observed at Alalcomenos by the Platæans in a large grove, where they exposed in the open air pieces of boiled flesh, and carefully observed whither the crows that came to prey upon them directed their flight. All the trees upon which any of these birds alighted were immediately cut down, and with them statues were made, called Dædala, in honour of Dædalus. The other festival was of a more solemn kind. It was celebrated every sixty years by all the cities of Bœotia, as a compensation for the intermission of the smaller festivals, for that number of years, during the exile of the Platæans.

DÆDALUS, in fabulous history, an Athenian, son of Eupalamus, descended from Erechtheus, king of Athens, was the most ingenious artist of his age, and to him we are indebted for the invention of the wedge, and many other mechanical instruments, and the sails of ships. From envy, he threw his nephew Dalus down from a window and killed him, on account of his ingenuity in the arts. After the murder, Dædalus, with his son Icarus, fled from Athens to Crete, where Minos gave him a cordial reception. Dædalus made a famous labyrinth for Minos, and assisted Pasiphæ, the queen, to gratify her unnatural passion for a bull. For this action, Dædalus incurred the displeasure of Minos, who ordered him to be confined in the labyrinth which he had constructed. Here he made himself wings with feathers and wax, and carefully fitted them to his body, and that of his son, who was the companion of his confinement. They took their flight from Crete; and the heat of the sun melted the wax on the wings of Icarus, who flew too high, and he fell into that part of the ocean, which from him has been called the Icarian sea. The father alighted at Cumæ in Italy, where he built a temple to Apollo, and thence directed his course to Sicily, where he was kindly received by Cocalus, who reigned over part of the country. Many monuments of his ingenuity in Sicily still existed in the age of Diodorus Siculus. He was dispatched by Cocalus, who *was afraid of Minos, who had declared war against him, because he had given an asylum to Dædalus.* The flight of Dædalus from Crete, with wings, is explained by observing that he was the inventor of sails, which in his age might pass at a distance for wings. (*Paus. Diod. Ovid*, &c.)—There were two statuaries of the same name, one of Sicyon, son of Patroclus, the other a native of Bythinia.

DÆMON, *δαιμων*, a name given by the ancients to certain spirits or genii, which they say appeared to men, either to do them service or to hurt them. According to the philosophers, dæmons held a middle rank between the celestial gods and men on earth, and carried on all intercourse between them; conveying the addresses of men to the gods, and the divine benefits to men. Dæmon is often used generally as equivalent to a deity, and is accordingly applied to fate or fortune, or whatever else was regarded as a god.

The word dæmon is used indifferently in a good and a bad sense. In the former it was very common among the ancient heathens. But it has been generally thought, that by dæmons we are to understand devils, in the Septuagint version of the Old Testament. Others think the word is in that version certainly applied to the ghosts of such dead men as the heathens deified, in Deut. xxxii. 17. Ps. cvi. 37. That dæmon often bears the same meaning in the New Testament, is shewn by Mr. Joseph Mede, Works, p. 623, &c.

Different orders of dæmons had different stations and employments assigned them by the ancients. Good dæmons were considered as the authors of good to mankind; evil dæmons brought innumerable evils both upon men and beasts. Amongst evil dæmons there was a great distinction with respect to the offices assigned them; some compelled men to wickedness, others stimulated them to madness. See DÆMONIAC.

DÆMONIAC. (from *dæmon.*) A human being whose volition and other mental faculties are overpowered and restrained, and his body possessed and actuated by some created spiritual being of superior power. Such seems to be the determinate sense of the word; but it is disputed whether any of mankind ever were in this unfortunate condition.

It has been urged, that the doctrine of dæmoniacal possessions is manifestly repugnant to the perfections of God, and to that fixed order of causes and effects which we discover in nature particularly with regard to the human system: but it does not appear to us that this kind of argument rests upon the firmest foundation. It is from the nature of the effect that we come to know the nature of the cause in any case. In the case, then, of dæmoniacs, the fact being admitted that their reason was disordered in a very extraordinary manner, we have to enquire whether the cause be mechanical or spiritual. Now from a due consideration of the nature of such motions and effects as are called mechanical, it very clearly follows, *that the cause, in the instances adduced, cannot be material. Either, then, we must* admit that the cause is a separate spirit, or we must formally ascribe the effect of disordering our reason to the Supreme Being. Would it be commendable to ascribe, upon slight grounds, such hurtful effects to a beneficent and good cause; and particularly to the great First Cause? Let it be remembered, that by denying, in such instances, secondary and imperfect causes, we load the most perfect of beings with all that is mean and unworthy.

After all, however, we think that the most satisfactory way of deciding the point is, by appealing to the Holy Scriptures. Mede, Bekker, and some other ingenious men, have maintained that the supposed dæmoniacs were only lunatics or epileptics. But let the story of the dæmoniac which is recorded by Luke, ch. iv. be duly considered, and there will appear sufficient reason for adhering to the received interpretation. Is it at all probable that Jesus should personify a lunacy or an epilepsy, and say, "Hold thy peace and come out of him?" Is it credible that an evangelist should have been left to ascribe this man's disorder to the spirit of an unclean dæmon, if it were only lunacy or the falling sickness; or that a physician of common sense (as Luke certainly was, to say the least) should speak of it as a memorable circumstance that such a distemper did not hurt a man by leaving him? Surely then this story, without seeking for other evidence, must be a convincing proof of the reality of dæmoniacal possession.

DÆMONOMA'NIA. (*dæmonomania*, *δαιμονομανια*, from *δαιμων*, a dæmon, and *μανια*, madness.) That species of melancholy, where the patient supposes himself to be possessed of devils.

DAFFODIL. In botany. See NARCISSUS.

DAFFODIL (Lily). See AMARILLIS and PANCRATIUM.

DAFFODIL (Sea). See PANCRATIUM.

To DAFT. *v. a.* (from *do aft.*) To toss aside; to throw away slightly: not used (*Shakspeare*).

DAG. *s.* (*dague*, French.) Not used. 1. A dagger. 2. A hand-gun; a pistol.

To DAG. *v. a.* (from *daggle.*) To daggle; to bemire: a low word.

DAGENHAM, a village near Rumford, in Essex, nine miles from London, remarkable for a breach made by the river Thames, which laid near 50,000 acres of land under water; but after ten years inundation, and several unsuccessful attempts, it was at last effectually drained by captain Perry, whom the czar Peter of Muscovy had employed in his works at Veronitz, on the river Don. In 1765, a second breach was made, which laid 5,000 acres under water; but after the works were several times blown up, it was at last stopped, and the banks secured. See Perry's Account of the Stopping of Dagenham Breach, 8vo. 1721.

DA'GGER. *s.* (*dague*, French.) 1. A short sword; a poniard (*Addison*). 2. A blunt blade of iron with a basket hilt, used for defence. 3. The obelisk: as (†).

DA'GGERSDRAWING. *s.* (*dagger* and *draw.*) The act of drawing daggers; approach to open violence (*Hudibras*).

DAGGER-POINTED, Daggered, or Mucronate, in natural history, ending in a point like that of a dagger. Applied to the leaf of bromelia ananas, and to the calyx.

To DA'GGLE. *v. a.* (from *dag*, dew.) To dip negligently in mire or water.

To Da'ggle. *v. n.* To be in the mire (*Pope*).

DA'GGLETAIL. *a.* (*daggle* and *tail.*) Bemired; bespattered (*Swift*).

DAGHESTAN, a province of Asiatic Turkey, having the Caspian sea on the E. the mountains of Caucassus on the W. Circassia on the N. and Shirvan on the S. The inhabitants are Tartars.

DAGHO, an island of the Baltic sea, belonging to Russia, nine miles long, and six broad. Lat. 58. 44 N. Lon. 22. 56 E.

Dagho, an episcopal town of Albania, in European Turkey. Lat. 42. 30 N. Lon. 19. 39 E.

DAGON, an idol of the Philistines, mentioned in the Book of Kings. Some authors say, that its uppermost part was like the body of a man, and its undermost like a fish: the Hebrew word dag signifies a fish: yet it must be granted that Dagon may come from Dagan, i. e. wheat: and Philo in Eusebius has rendered the word Dagon by that of Σιτω, *frumentum* or *frumenti præses*.

The Philistines held Dagon in great veneration, and erected magnificent temples in his honour. His temple at Gaza must have been very large, since Sampson, having pulled down the pillars that supported it, buried more than 3000 men in its ruins.

DAGY'SA, in zoology, a genus of the class vermes, order mollusca. Body loose, natant, angular, tubular, and open at each extremity. One species only: found in the Spanish seas: three inches long and one thick. The difference between this and the genus Sulpa, which see, is so trifling, that it is scarcely worth while to continue the distinction. Yet it does not become us, at least in the present work, to introduce any innovation, but only to give the result of general science, and investigation, so far as they have successfully proceeded. The worms of this genus have a peculiar power of adhering to each other by their sides.

DAHALAE, in geography, an island in the Red sea, near the coast of Abyssinia. Its whole length from N.W. to S.E. is thirty-seven miles, and its greatest breadth eighteen.

DAHL, the finest river of Sweden, which flows through Dalecarlia and on the S. confines of Gestricia, and falls into the gulf of Bothnia, to the E. of Gefle. Near Escarleby, it forms a celebrated cataract, scarce inferior to the fall of the Rhine at Lauffen.

DAHLIA, in botany. This genus was established by the late Cavanilles, in honour of Dr. Andrew Dahl, a Swedish botanist, and the friend of baron Alstrœmer. It belongs to the class syngenesia, order polygamia frustranea, at least in this cold climate. The stems die every winter, but the root is perennial and tuberous, not very dissimilar to that of the artichoke. Four species have been described.

1. D. pinnata, pinnated as it is called, and figured by Cavanilles in his Icones, Plate v. 1. tab 80. It is also figured under this name in the fourth volume of Andrews's Botanical Repository. In the Annales du Mus. National Hist. Nat. v. 3. M. Thouin calls this species purpurea, but its colour varies from the common pinnata, being very deep; and Mr. R. A. Salisbury suspects that this purpurea of Thouin is the true rosea of Cavanilles. A paler coloured variety of the pinnata, the seeds of which were sent to Holland-house with the name of rosea by Cavanilles, has been lately figured by Mr. Hooker in the Paradisus Londinensis, and described by the above-mentioned botanist, under the name of sambucifolia: that it is not the true rosea of Cavanilles, is unquestionable; for the leaves were simply pinnate, not bipinnate.

2. D. rosea. Rose-coloured. It is so called and figured by Cavanilles in his Icones; but the plant called rosea by M. Thouin in the Annales, is most probably the very variety of the first species figured by the name of sambucifolia in the Paradisus Londinensis.

3. D. coccinea. Scarlet. This is figured in Curtis's publication; but we entertain a doubt if it is the same with Cavanilles's plant, if the colour is well copied. The plant, we understand, is dead.

4. D. crocata. Saffron-coloured. This plant is not mentioned in any work previous to the Paradisus Londinensis, where it is figured and described by the name of bidentifolia. Though the parcels of seeds which came from Cavanilles himself had the title of crocata, the flowers turned out yellow.

It is not intended here to describe minutely these plants; it is sufficient to say, that they elevate themselves majestically like the holy-hock, and bear both axillary and terminal showy flowers late in the autumn.

DAHOMEY, or Dauma, a country of Africa, on the slave coast, situated about sixty or seventy miles from the Atlantic; called also Fouin. Dahomey, as known at present, is supposed to reach from the sea-coast about 150 or 200 miles inland, though no European has penetrated above half that distance. The capital, Abomey, lies in about nine degrees and fifty minutes of north latitude, and between the third and fourth degree of east longitude, reckoned from the meridian of Greenwich. The soil is a deep, rich clay, of a reddish colour, with a little sand on the surface, except about Calmina, where it is more light and gravelly: but there is not to be found a stone so big as an egg in the whole country, so far as it has been visited by the Europeans; of farinaceous vegetables the country yields a plentiful supply, proportionable to the quantity of culture;

namely maize, millet, or Guinea-corn of different sorts; a kind of peas, or rather kidney-beans, called callavances; and also a species of beans, called ground-beans. The Dahomans, likewise, cultivate yams, potatoes of two sorts, the cassada, or manioka, the plantain, and the banana. Pine-apples, melons, oranges, limes, guavas, and other tropical fruits, also abound in this fertile country. Nor is it destitute of productions adapted for commerce and manufacture; such as indigo, cotton, the sugar-cane, tobacco, palm oil, together with a variety of spices, particularly a species of pepper, very similar in flavour, and indeed scarcely distinguishable from the black pepper of the East Indies. A very curious fruit is produced in Dahomey, as well as in some other parts of Africa, which resembles a small olive in every respect but the colour; being of a dusky reddish hue, changing at the end next the stalk to a faint yellow; the pulp is firm, and almost insipid; the stone is hard like that of the olive. After having chewed one or more of such berries, and spit out or swallowed the pulp at pleasure, a glass of vinegar will taste, to the person trying the experiment, like sweet wine; a lime will seem to have the flavour of a very ripe China orange; and the same change is produced in other acids, without effervescence, or any sensible motion. The Dahomans, like the other inhabitants of tropical climates, plant twice a year, viz. at the vernal and autumnal equinoxes; after which the periodical rains prevail. The language is that which the Portuguese call Lingua Geral, or General Tongue, and is spoken not only in Dahomey Proper, but in Whydah, and the other dependent states; and likewise in Mahee, and several neighbouring places. With respect to the Dahoman religion, it consists of a jumble of superstitious ceremonies, of which it is impossible to convey any satisfactory idea. The government is perhaps the most perfect despotism on earth. See farther Archibald Dalzel's History of Dahomey, 4to.

DAHOON HOLLY. In botany. See Ilex.

DA'ILY. *a.* (ꝺaᵹlic, Saxon.) Happening every day; quotidian (*Prior*).

Da'ily. *ad.* Every day; very often (*Spenser*).

DA'INTILY. *ad.* (from *dainty*.) 1. Elegantly; delicately (*Bacon*). 2. Deliciously; pleasantly (*Howel*).

DA'INTINESS. *s.* (from *dainty*.) 1. Delicacy; softness (*Ben Jonson*). 2. Elegance; nicety (*Wotton*). 3. Delicacy; deliciousness (*Hakewill*). 4. Squeamishness; fastidiousness (*Wotton*). 5. Ceremoniousness; scrupulosity.

DA'INTY. *a.* (*dain*, old French, delicate.) 1. Pleasing to the palate; delicious (*Bacon*). 2. Delicate; nice; squeamish (*Davies*). 3. Scrupulous; ceremonious (*Shakspeare*). 4. Elegant; effeminately beautiful (*Milton*). 5. Nice; affectedly fine (*Prior*).

Da'inty. *s.* 1. Something nice; a delicacy (*Pope*). 2. A word of fondness formerly in use (*Shakspeare*).

DA'IRY. *s.* (from *dey*, an old word for milk.) 1. The occupation or art of making various kinds of food from milk (*Temple*). 2. The place where milk is manufactured. 3. Pasturage; milk farm (*Bacon*).

Dairy-house, or **Dairy**, in rural economy, a place appropriated to the management of milk, butter, cheese, &c. See Milk, Butter, Cheese, Churn, and Cows.

A dairy ought to be so situated, that the windows, or lattices, may never front the south, south-east, or south-west; and it should at all times be kept in the neatest order. Lattices are also far preferable to glazed lights, as they admit a free circulation of the air. It has, however, been objected, that the former afford access to the cold air of winter, and to the sun in summer; but either may be easily remedied, by making the frame somewhat larger than the lattice, and constructing it so as to slide backward and forward at pleasure. Across this frame, packthread may be stretched, and oiled paper pasted on it, which will thus admit the light, and effectually keep out the sun and wind.

During the summer, dairy-houses cannot be kept too cool: they ought therefore to be erected, if possible, near a cold spring, or running water; and, where it is practicable to conduct a small stream through the premises, it will much contribute to the convenience and utility of the place. Dr. Anderson observes, in his Practical Essay on the Management of the Dairy (published in the third and fourth volumes of his Recreations in Agriculture, &c.) that, if the water can be introduced by means of a pipe, so as to fall from some height on the floor, it will be productive of many advantages, particularly by preserving a continual freshness, and purity of the air. Dairy-houses should therefore be neatly paved, either with red brick, or smooth hard stone, and laid with a proper descent, so that no water may stagnate. This pavement should be well washed every day during the summer; and all the utensils, here employed, be kept with unremitting attention to cleanliness. Nor should the churns be at any time scalded in the dairy; as the steam arising from hot water, tends greatly to injure the milk. For similar reasons, neither the cheese and rennet, nor the cheese-press, must be suffered to taint the atmosphere; as the whey and curd will diffuse their acidity over the whole building.

All the utensils of the dairy should be made of wood, in preference either to lead, copper, or cast-iron; for these metals are easily soluble in acids; the solutions of the two first are in a high degree poisonous; and though the latter is in itself harmless, the taste of it renders the productions of the dairy very disagreeable. The cream-dishes, when perfectly clean and cool, ought to be filled with the milk, as soon as it is drawn from the cow, and has been carefully strained through a cloth, or cloth-sieve made of hair or silver-wire; the latter of which, as Dr. Anderson justly remarks, is more wholesome than those of other metals. These dishes should never exceed three inches in depth, but may be so wide as to contain a gallon, or a gallon and a half of milk. When filled, they ought to be placed on shelves, to remain there till the cream be completely separated. Now it is to be taken off with nicety, by a skimming-dish (without lifting or removing the milk, or shedding any of it on the floor, which would soon corrupt the air of the room), and then deposited in a separate vessel, till a proper quantity be collected for churning. A firm, neat wooden barrel, which is open at one end, and has a lid closely fitted to it, appears to be well calculated for this purpose; a cock or spigot ought also to be fixed near the bottom, to draw off the thin or serous part, that may drain from the cream; and the inner side of the opening should be covered with a piece of fine silver wire-gauze, in order to prevent the latter from escaping, while the former is allowed to pass.

But, if notwithstanding the fatal consequences arising from the use of metallic utensils, or of earthen vessels glazed with lead, farmers still persist in employing them, it ought to be a constant and indispensable rule, to scald and scour them properly with salt and water every day, and to dry them thoroughly, before the milk is deposited in them. Lastly, it is sincerely to be wished, that all the utensils employed in the dairy, of whatever materials they may consist, should be cleaned with similar care, previously to their being used; and, as long as the least acid smell is perceptible, they ought to undergo repeated scourings, till they are completely sweetened.

Da'irymaid. *s.* (*dairy* and *maid.*) The woman servant whose business is to manage the milk (*Dryden*).

DAIS, in botany, a genus of the class decandria, order monogynia. Involucre four-leaved; corol four or five-cleft; berry one-seeded. Three species, natives of the Cape or Tongataba island.

DA'ISY. *s.* (ꝺæᵹeꞅeaᵹe, Saxon, day's eye.) A spring flower. See **Bellis**.

Da'isy (Blue). See **Globularia**.

Da'isy (Ox-eye). See **Chrysanthemum**.

Da'isy (Michaelmas). See **Aster**.

Daisy-cutter, in veterinary language, a term for a horse that goes so near the ground as frequently to touch it with the tip of his toes, and to be in continual danger of falling. Most broken-kneed horses are of this kind.

DALACA, an island of the Red sea, opposite the coast of Abex, seventy-two miles long, and fifteen broad. The inhabitants are negroes.

DALBERGIA, in botany, a genus of the class diadelphia, order decandria. Calyx obsoletely five-toothed; legume foliaceous, flat, not opening; seeds one or two. Seven species; all East India plants, shrubs, or trees. Of these, d. monitaria of Surinam, with very minute, white, spiked flowers, yields from its wood a resin resembling dragon's-blood.

DALE. *s.* (*thal*, German.) A hollow between high grounds.

Valley also (*vallis*, Latin; *vallée*, French), signifies a hollow between high grounds. The one is a northern, and the other a southern word, for the same idea. But, as it is esteemed a perfection in English writing to construct an antithesis with words of collocal origin, it is become usual to oppose *dale* to *hill*, which is also a word of Saxon descent; and to oppose *valley* to *mountain*, which is also a word of French descent. Hence we are accustomed to attach ideas of inferior magnitude to *dale*, and of superior magnitude to *valley*: by standing in opposition to the words *hill* and *mountain*, they have acquired the same relative character for dimension.

DALEA, a province of Sweden, bounded on the north by Dalecarlia, on the east by the Wermerland and the lake Wener, on the south by Gothland, and on the north by Norway and the sea.

Dalea, in botany, a genus of the class diadelphia, order decandria. Wings and heel growing to the column of the stamens; stamens five or ten, united without any separate filaments; legume one-seeded. Fourteen species; all natives of North or South America.

DALECARLIA, a province in Sweden, so called from a river of the same name, on which it lies, near Norway. It is divided into three parts, which they call valleys; and is about 175 miles in length, and 100 in breadth. It is full of mountains, which abound in mines of copper and iron, some of which are of a prodigious depth.

DALECHAMPIA, in botany, a genus of the class monoecia, order monodelphia. Outer common involucre with three leaflets; inner with two three-cleft leaves. Male umbellule ten-flowered; involucel two-leaved, with numerous chaffs; proper perianth five-leaved; corolless; filaments numerous. Fem. florets three-involucel, three-leaved; proper perianth of eleven leaflets; corolless; style filiform; capsule three-grained. Two species only, d. corolata, of New Grenada; and d. scandens, of the West Indies; the last a climbing plant, as its name imports, rising to a considerable height, and armed on its leaves with bristly hairs, that sting the moment they are touched.

D'ALEMBERT. See **Alembert d'.**

DALEN (Cornelius van), a Dutch engraver, born about 1640. He engraved a great variety of portraits, and a set of antique statues in a masterly style.

DALIN (Olaus de), a Swedish poet, born at Winsberg in 1708. He wrote a poem, entitled, The Liberty of Sweden, and a tragedy entitled Brunhilda. He is also the author of the General History of Sweden, and other works. He became preceptor to prince Gustavus, and chancellor of the court; and died in 1763.

DALKEITH, a town of Scotland, in Mid Lothian. Lat. 55. 54 N. Lon. 3. 12 W.

DA'LLIANCE. *s.* (from *dally.*) 1. Interchange of caresses; acts of fondness (*Milton*) 2. Conjugal conversation (*Milton*). 3. Delay; procrastination (*Shakspeare*).

DA'LLIER. *s.* (from *dally.*) A trifler; a fondler (*Ascham*).

DA'LLOP. *s.* A tuft, or clump (*Tusser*).

To DA'LLY. *v. n.* (*dollen*, Dutch, to trifle.) 1. To trifle; to play the fool (*Calamy*). 2. To exchange caresses; to fondle (*Shakspeare*). 3. To sport; to play; to frolick (*Shakspeare*). 4. To delay (*Wisdom*).

To DA'LLY. *v. a.* To put off; to delay; to amuse till a proper opportunity (*Knolles*).

DALMATIA, a province of Europe, which is divided among the Venetians, Hungarians, Ragusans, and Turks. It has Bosnia on the N. the gulph of Venice on the S. Servia on the E. and Morlachia on the W.

DALMATICA, a garment with large open sleeves, worn originally by bishops.

DALRYMPLE (sir David), a Scotch judge. He was born at Edinburgh in 1726. His father was auditor of the exchequer for Scotland, and his mother daughter of the earl of Haddinton. He was educated at Eton, from whence he was sent to Utrecht, where he continued till 1746, and then returned to Edinburgh, and became an advocate. In 1766 he was appointed a judge, on which occasion he took the title of lord Hailes, according to the custom of the country. He died in 1792, leaving two daughters. Lord Hailes wrote and published a great number of books and tracts, as Memorials and Letters relating to the History of Britain in the Reign of James I. and Charles I. two vols. 1762, and 1766, Remarks on the History of Scotland, 1773, 12mo.; Annals of Scotland, 4to. 1779, two vols.; Remains of Christian Antiquity, 1778, three vols.; several Memoirs, intended for a Biographia Scotica, &c.

Though the church of Scotland does not much encourage funeral discourses, a very laudable endeavour was made to render the talents and virtues of lord Hailes a theme of instruction to mankind, in a sermon preached soon after his death in the church of Inveresk, by his learned friend, and venerable pastor, Dr. Carlyle; from which we shall transcribe a summary view of his character as a judge, a scholar, a Christian, and a citizen.

"His knowledge of the laws was accurate and profound, and he applied it in judgment with the most scrupulous integrity. In his proceedings in the criminal court, the satisfaction he gave to the public could not be surpassed. His abhorrence of crimes, his tenderness for the criminals, his respect for the laws, and his reverential awe of the Omniscient Judge, inspired him on some occasions with a commanding sublimity of thought, and a feeling solemnity of expression, that made condemnation seem just as the doom of Providence to the criminals themselves, and raised a salutary horror of crimes in the breast of the audience.

"Conscious of the dignity and importance of the high office he held, he never departed from the decorum that becomes that reverend character; which indeed it cost him no effort to support, because he acted from principle and sentiment, both public and private. Affectionate to his family and relations, simple and mild in his manners, pure and conscientious in his morals, enlightened and entertaining in his conversation; he left society only to regret, that, devoted as he was to more important employments, he had so little time to spare for intercourse with them.

"He was well known to be of high rank in the republic of letters, and his loss will be deeply felt through many of her departments. His labours in illustration of the history of his country, and many other works of profound erudition, remain as monuments of his accurate and faithful research for materials, and his sound judgment in the selection of them. Of his unfeigned piety and devotion, you have very often been witnesses where we now are. I must add, however, that his attendance on religious ordinances was not merely out of respect to the laws and for the sake of example (motives which should never fail to have influence on persons of superior rank, for the most obvious reasons), but from principle and conviction, and the most conscientious regard to his duty; for he not only practised all the virtues and charities in proof of his faith, but he demonstrated the sincerity of his zeal by the uncommon pains he took to illustrate primitive Christianity, and by his elaborate and able defences of it against its enemies.

"His profound researches into history, and his thorough knowledge of the laws, made him perfectly acquainted with the progress of the constitution of Britain, from the first dawn of liberty in the common law of the land, and the trial by jury which precede all written records, and afterwards in the origin and establishment of parliaments, through all its vicissitudes and dangers, till at last, by the blessing of divine Providence, which brought many wonderful events to concur to the same end, it was renewed, strengthened, and finally confirmed by the Revolution.

"It was this goodly and venerable fabric of the British constitution which the deceased most respectable character contemplated with admiration and delight (of late, indeed, with a mixture of anxiety and fear), as the temple of piety, as the genuine source of greater happiness and freedom, to a larger portion of mankind than ever flowed from any government upon earth.

"Ill indeed can the times bear the loss of such an affectionate patriot and able guardian of the laws of his country. But we must not murmur at the will of Providence, which in its mercy 'may have withdrawn the good man from the evil to come.' In mercy, I say, to him, whose righteous spirit was so deeply grieved when 'he saw the wicked rage, and the people imagine a vain thing.'"

Such is the memorial which, in the hour of recent sorrow, followed this excellent man to the grave; and we believe it will yet be allowed to be just by all who had the happiness of his lordship's acquaintance, and are what he was, friends to the best interests of mankind.

A large catalogue of the numerous and curious performances of lord Hailes is given under the article Dalrymple, in the Supplement to the Encyclo. Britan.

DALTON, a town of Lancashire, with a market on Saturdays. Lat. 54. 14 N. Lon. 3. 18 W.

DALUS, in antiquity, a narrow slip of pasture, between two pieces of arable land.

DAM. *s.* (from *dame*, which anciently signified mother.) The mother (*Ray*).

Dam. *s.* (*dam*, Dutch.) A mole or bank to confine water (*Mortimer*).

To **Dam.** *v. a.* (ꝺemman, Saxon; *dammen*, Dutch.) To confine, or shut up, water by moles or dams (*Otway*).

DA'MAGE. *s.* (*domage*, French.) 1. Mischief; hurt; detriment (*Davies*). 2. Loss; mischief suffered (*Milton*). 3. The value of mischief done (*Clarendon*). 4. Reparation of damage; retribution (*Bacon*). 5. (In law.) Any hurt or hinderance that a man taketh in his estate (*Cowell*).

To **Da'mage.** *v. a.* To mischief; to injure; to impair; to hurt; to harm (*Addison*).

To **Da'mage.** *v. n.* To take damage.

DA'MAGEABLE. *a.* (from *damage.*) 1. Susceptible of hurt: as, *damageable* goods. 2. Mischievous; pernicious (*Govern. of Tongue*).

DAMAN OF ISRAEL. In zoology. See Dipus.

Daman, a maritime town of the East Indies, at the entrance of the gulph of Cambaya. It belongs to the Portuguese. Lat. 20. 20 N. Lon. 72. 35 E.

DA'MASCENE. (from *Damascus.*) A small black plum; a damson (*Bacon*).

DAMASCENUS (John), an illustrious father of the church in the eighth century, born at Damascus, where his father, though a Christian, enjoyed the office of counsellor of state to the Saracen caliph; to which the son succeeded. He retired afterwards to the monastery of St. Sabas, and spent the remainder of his life in writing books of divinity. His works have been often printed; but the Paris edition in 1712, two volumes folio, is esteemed the best.

DAMASCIUS, a celebrated heathen philosopher, born at Damascus in the year 540, when the Goths reigned in Italy. He wrote the Life of his master Isidorus; and dedicated it to Theodora, a very learned and philosophical lady, who had also been a pupil to Isidorus. In this life, which was copiously written, he frequently made oblique attacks on the Christian religion. We have nothing remaining of it but some extracts preserved by Photius. Damascius succeeded Theon in the rhetorical school, and Isidorus in that of philosophy, at Athens.

DAMASCUS, now called Scham, a considerable town of Syria, in Asiatic Turkey. It is situated on a fertile plain, encompassed with hills, and finely watered by the river Barrady, anciently the Pharphar, the stream of which flows through the city, and supplies the fountains, bagnios, and houses. The appearance of this city is inexpressibly beautiful at a little distance, but not altogether so fine within it, though the mosques, and other public buildings, are in general handsome. In Scham, a considerable silk manufactory is carried on, and several other articles are furnished by the luxuriancy of its neighbourhood. It is the see of an archbishop, and is inhabited by great numbers of Christians and Jews. Lat. 33. 45 N. Lon. 37. 0 E.

Damascus steel, a very fine kind of steel, made in some parts of the Levant, and particularly at Damascus, remarkable for its excellent temper; and used chiefly in the making of sword-blades.

Some authors assure us it comes from the kingdom of Golconda in the East Indies; where the method of tempering with alum, which the Europeans have never been able to imitate, was first invented.

DAMASK, a silk stuff, with a raised pattern, so that the right side of the damask is that which has the flowers raised or saturated. Damasks should be of dressed silk, both in warp and woof; and in France, half an ell in breadth: they are made at Chalons, in Champagne, and in some places in Flanders, as at Tournay, &c. entirely of wool, three-eighths of an ell wide, and twenty ells long.

Damask is also a kind of wrought linen made in Flanders and in this country. It takes its name on account of its resemblance to damask. It is chiefly used for table linens.

To **Da'mask.** *v. a.* (from the noun.) 1. To form flowers upon stuffs. 2. To variegate; to diversify (*Fenton*).

Da'mask-rose. *s.* A red rose (*Bacon*). See Rosa.

DAMASKEENING, or **Damasking**, the art or operation of beautifying iron, steel, &c. by making incisions in them, and filling them up with gold and silver wire; chiefly used for adorning sword-blades, guards, and gripes, locks of pistols, &c. Damaskeening partakes of the mosaic, of engraving, and of carving: like the mosaic, it has inlaid work; like engraving, it cuts the metal representing different figures; and as in chasing, gold and silver are wrought in relievo. There are two ways of damasking: the one, which is the finest, is when the metal is cut deep with proper instruments, and inlaid with gold and silver wire; the other is superficial only.

DAMASO'NIUM, in botany, a genus of the class hexandria, order hexagynia. Spathe one-leaved, five-winged; calyx superior, three-parted; corol three-petalled; berry ten-celled, many-seeded. One species only; a native of India, with radical, heart-shaped, entire leaves, and a one-flowered scape.

DAMATRIUS, the Bœotian name for the Athenian month Pyanepsian.

DAMAUN, a seaport of the Deccan of Hindustan, at the entrance of the gulf of Cambay. It is subject to the Portuguese. Lat. 20. 20 N. Lon. 72. 25 E.

DAME. *s.* (*dame*, French; *dama*, Spanish.) 1. A lady; the old title of honour to women. 2. Mistress of a low family (*L'Estrange*). 3. Woman in general (*Shakspeare*).

DAME's VIOLET. In botany. See HESPERIS.

DAMIANISTS, in church history, a branch of the ancient acephali severitæ. They agreed with the Catholics in admitting the fourth council, but disowned any distinction of persons in the Godhead; and professed one single nature, incapable of any difference; and yet they called God the Father, Son, and Holy Ghost. They seem to have been a kind of Sabellians. They took their name from Damianus, a bishop of Alexandria, in the sixth century.

DAMIETTA, an ancient and rich town of Egypt, with a good harbour, and a Greek archbishop's see. It is seated on one of the eastern mouths of the Nile, and contains about 80,000 inhabitants. This was the ancient Pelusium. Lat. 31. 22 N. Lon. 31. 55 E.

To **DAMN.** *v. a.* (*damno,* Latin.) 1. To doom to eternal torments in a future state (*Bacon*). 2. To procure or cause to be eternally condemned (*South*). 3. To condemn; to censure (*Dryden*). 4. To hoot or hiss any public performance; to explode (*Pope*).

DA'MNABLE. *a.* (from *damn.*) 1. Deserving damnation (*Hooker*). 2. Odious; pernicious (*Shakspeare*).

DA'MNABLY. *ad.* (from *damnable.*) In such a manner as to incur eternal punishment (*South*).

DAMNA'TION. *s.* (from *damn.*) Exclusion from divine mercy; condemnation to eternal punishment (*Taylor*).

DA'MNATORY. *a.* (from *damnatorius,* Lat.) Containing a sentence of condemnation.

DA'MNED. *part. a.* (from *damn.*) Hateful; detestable; abominable (*Rowe*).

DAMNI'FICK. *a.* (from *damnify.*) Procuring loss; mischievous.

To **DA'MNIFY.** *v. a.* (from *damnifico,* Latin.) 1. To endamage; to injure (*Locke*). 2. To hurt; to impair (*Spenser*).

DA'MNINGNESS. *s.* (from *damning.*) Tendency to procure damnation (*Hammond*).

DAMOCLES, one of the flatterers of Dionysius the Elder, of Sicily. He admired the tyrant's wealth, and pronounced him the happiest man on earth. Dionysius prevailed upon him to undertake for a while the charge of royalty, and be convinced of the happiness which a sovereign enjoyed. Damocles ascended the throne, and while he gazed upon the wealth and splendor that surrounded him, he perceived a sword hanging over his head by a horse-hair. This so terrified him, that all his imaginary felicity vanished at once, and he begged Dionysius to remove him from a situation which exposed his life to such fears and dangers. (*Cicero*).

DAMON. The most celebrated of this name is a Pythagorean philosopher, very intimate with Pythias. When he had been condemned to death by Dionysius, he obtained from the tyrant leave to go and settle his domestic affairs, on promise of returning at a stated hour to the place of execution. Pythias pledged himself to undergo the punishment which was to be inflicted on Damon, should he not return in time; and he consequently delivered himself into the hands of the tyrant. Damon returned at the appointed moment, and Dionysius was so struck with the fidelity of these two friends, that he remitted the punishment, and entreated them to permit him to share their friendship, and enjoy their confidence. (*Val. Max.*).

DAMP. *a.* (*dampe,* Dutch.) 1. Moist; inclining to wet; foggy (*Dryden*). 2. Dejected; sunk; depressed (*Milton*).

DAMP. *s.* 1. Fog; moist air; moisture (*Dryden*). 2. A noxious vapour exhaled from the earth (*Woodward*). 3. Dejection; depression of spirit (*Roscommon*).

To **DAMP.** *v. a.* (from the noun.) 1. To wet; to moisten; to make humid. 2. To depress; to deject; to chill (*Atterbury*). 3. To weaken; to abate; to hebetate (*Milton*).

DAMPIER (William), a famous navigator, descended from a good family in Somersetshire, in England, was born in 1652. Losing his father when very young, he was sent to the sea, where he soon distinguished himself, particularly in the South seas. His voyage round the world is well known, and has gone through many editions. He appears afterwards to have engaged in an expedition concerted by the merchants of Bristol to the South sea, commanded by captain Woods Rogers; who sailed in August 1708, and returned by September 1711: but we have no further particulars of his life or death.

DAMPIER's STREIGHT, a passage or opening discovered by captain Dampier, between King William's cape in New Guinea, in the South seas, and that tract to the eastward of it, with which it was formerly thought to join.

DA'MPISHNESS. *s.* (from *damp.*) Tendency to wetness; fogginess; moisture (*Bacon*).

DA'MPNESS. *s.* (from *damp.*) Moisture; fogginess (*Dryden*).

DAMPS, in natural history, noxious steams and exhalations, frequently found in mines, pits, wells, and other subterraneous places. See GAS.

DA'MPY. *a.* (from *damp.*) Dejected; gloomy; sorrowful (*Hayward*).

DAMSEL, DAMOISEL, or **DAMOISEAU,** an appellation anciently given to all young people of genteel or noble extraction of either sex, e. gr. to the sons and daughters of knights, barons, and even of kings. Thus, in history, we read of the damsel Pepin, damsel Louis le Gros, damsel Richard, prince of Wales. Pasquier will have the word a diminutive of dam, an ancient name for lord; as in some authors we read Dam Dieu for Lord God; dam chevalier, &c. Though in its feminine sense he takes it to come from dame. Others derive the word from *domicellus,* or *domnicellus,* a diminutive of *domnius, quasi parvus dominus;* accordingly, Du Cange observes, that it has been sometimes written *domenger.* They who hold the signory of Commercy, M. de la Roque tells us, anciently held it in the title of *damoiseau:* and

M. de Marca assures us, that the noblesse of Bern is still divided into three bodies, or classes; the barons, the cavers, and the damsels, *domicellos*, called in that country *domengers*. The kings of Denmark and Sweden have the same title, as appears from Pontanus's History of Denmark, lib. vii. and viii. and Henry of Upsal's History of Suec. lib. iii. From the sons of kings, the appellation passed to those of great lords and barons; and, at length, to those of gentlemen who were not yet knights.

Damsel, at present, is applied to all maids or girls not yet married; provided they be not of the lowest class of people.

Damsel is sometimes also applied to a kind of utensil put in beds, to warm old men's feet.

DAMSON, the fruit of the prunus damascena, which, when perfectly ripe, affords a wholesome article for pies, tarts, &c. gently opening the body; but when damsons are not perfectly mature, they produce cholicky pains, diarrhœa, and convulsions in children. See **Prunus** and **Chrysophyllum**.

DAN (Tribe of), in ancient geography, lay S.W. of the tribe of Judah, between it and the Mediterranean, contiguous to that of Simeon.

Dan. *s.* (from *dominus*, Latin.) The old term of honour for men (*Prior*).

DANAE, in fabulous history, the daughter of Acrisius, king of Argos, by Eurydice. She was confined in a brazen tower by her father, who had been told by an oracle, that his daughter's son would put him to death. His endeavours to prevent Danae from becoming a mother proved fruitless; as Jupiter, who was enamoured of her, introduced himself to her bed, by changing himself into a golder shower. From his embraces Danae had a son, with whom she was exposed on the sea by her father. The wind drove the bark which carried her to the coasts of the island of Seriphus, where she was saved by some fishermen, and carried to Polydectes, king of the place, whose brother, called Dictys, educated the child called Perseus, and tenderly treated the mother. Polydectes fell in love with her; but as he was afraid of her son, he sent him to conquer the Gorgons. When Perseus had victoriously finished his expedition, he retired to Argos with Danae to the house of Acrisius, whom he inadvertently killed. Some suppose that it was Prœtus, the brother of Acrisius, who introduced himself to Danae in the brazen tower; and instead of a golden shower, it was maintained, that the keepers of Danae were bribed by the gold of her seducer.

Danae, an ancient coin; somewhat more than an obolus.

DANÆA, in botany, a genus of the class cryptogamia, order filices. Fructification oblong-linear, transversely immersed in the frond, parallel, many-celled; cells in a double row, opening upwards; seeds numerous, very minute. Two species only; d. nodosa, and d. alata.

DANAIDES, in fabulous history, the fifty daughters of Danaus, king of Argos. When their uncle Ægyptus came from Egypt with his fifty sons, they were promised in marriage to their cousins; and before the celebration of their nuptials, Danaus, who had been informed by an oracle that he was to be killed by one of his sons-in-law, made his daughters solemnly promise that they would destroy their husbands. They were provided with daggers by their father, and all, except Hypermnestra, the wife of Lynceus, murdered their cousins the first night of their nuptials, and presented him with the heads of their husbands. Hypermnestra was summoned to appear before her father, but the unanimous voice of the people declared he innocent. The sisters, according to the more received opinion, were condemned in hell to fill with water a vessel full of holes, so that the water ran out as soon as poured into it, and therefore their labour was infinite, and their punishment eternal. Apollodorus has given a catalogue of the names of the Danaides, and their respective husbands.

DANAUS. See **Danaides**.

To **DANCE.** *v. n.* (*danser*, French.) To move in measure; to move with steps correspondent to the sound of instruments (*Shakspeare*).

To **Dance attendance.** *v. a.* To wait with suppleness and obsequiousness (*Raleigh*).

To **Dance.** *v. a.* To make to dance; to put into a lively motion (*Bacon*).

Dance, or **Dancing**, as at present practised, may be defined, "an agreeable motion of the body, adjusted by art to the measures or tune of instruments, or of the voice." But, according to what some reckon more agreeable to the true genius of the art, dancing is "the art of expressing the sentiments of the mind, or the passions, by measured steps or bounds that are made in cadence by regulated motions of the body, and by graceful gestures; all performed to correspond with certain musical sounds."

There is no account of the origin of the practice of dancing among mankind. It is found to exist among all nations whatever, even the most rude and barbarous; and, indeed, however much the assistance of art may be necessary to make any one perfect in the practice, the foundation must certainly lie in the mechanism of the human body itself.

The connection that there is between certain sounds and those motions of the human body called dancing, hath seldom been enquired into, though it is certainly a very curious speculation. The power of certain sounds not only over the human species, but even over the inanimate creation, is indeed very surprising.

It is conjectured by very eminent philosophers, that all the sensations and passions to which we are subject, are intimately connected with the vibrations excited in the nerves of the human body. Hence, musical sounds have the greatest power over those people who are of a delicate sensible frame, and who have strong passions. If it be true, therefore, that every passion in the human breast in some measure depends upon a certain affection of the nervous system, or a certain electric vibration in the nervous fluid, we shall immediately see the origin of the different dances among different nations. One kind of vibration, for instance, raises the passions of anger, pride, &c. which are indispensably necessary in warlike nations. The sounds, for such there are, capable of exciting a similar vibration, would naturally constitute the martial music among such nations, and dances conformable to it would be instituted. This appears to be the case particularly among barbarous nations. Other vibrations of the nerves awaken the passions of joy, love, &c.; and sounds capable of exciting these particular vibrations will immediately be formed into music for dancers of another kind.

Among the Jews, dancing seems to have made a part of the religious worship on some occasions, as we learn from passages in the Psalms; though we do not find either that or singing positively enjoined as a divine precept. The dancing of king David before the ark gave occasion to some complaints from his wife Michal, the haughty daughter of the haughty Saul; it also called forth the sneers of Mr. Bayle, in his dictionary: but it has been examined and vindicated with great learning and ingenuity, and complete success, by Dr. Delany, in his Life of David, king of Israel, vol. i. pp. 389, 428. We persuade ourselves, that most of our readers will be entertained with the dissertation on dancing there referred to. In the Christian churches mentioned in the New Testament there is no account of dancing being introduced as an act of worship, though it is certain that it was used as such in after ages. Mr. Gallini tells us, that "at Limoges, not long ago, the people used to dance the round in the choir of the church which is under the invocation of their patron saint; and at the end of each psalm, instead of the Gloria Patri, they sung as follows: 'St. Maroel, pray for us, and we will dance in honour of you.'" Though dancing would now be looked upon as the highest degree of profanation in a religious assembly, yet it is certain, that considered as an expression of joy, it is no more a profanation than singing, or than simple speaking; nor can it be thought much more absurd, that a Christian should dance for joy that Jesus Christ is risen from the dead, than that David danced before the ark when it was returned to him after a long absence.

Plato reduces the dances of the ancients to three classes. 1. The military dances, which tended to make the body robust, active, and well-disposed for all the exercises of war. 2. The domestic dances, which had for their object an agreeable and innocent relaxation and amusement. 3. The mediatorial dances, which were in use in expiations and sacrifices.

In most cases, dances are indications of joy: but there are people in South America who dance to shew their sorrow; and among the ancients, dancing made a part of the funeral solemnities.

Among the moderns, there are various kinds of dances, as country dances, cotillons, hornpipes, minuets, &c.: for directions to perform these with accuracy, taste, and elegance, we refer to those who professedly teach this art.

In the heavy days of autumn and winter, when the atmosphere is loaded with humid particles, when a sedentary life disposes the human body to hypochondriacal affections, dancing is an admirable amusement. Independently of the beneficial effects which music and a cheerful company display on a susceptible mind, moderate dances possess every advantage of gentle exercise. But those maniacal turnings and gesticulations, which have lately become fashionable in this country, under the appellation of German Vaults (or rather Walzen, i. e. performing a circular motion, like that of a man on the eve of intoxication), are attended with very different effects. It would be superfluous to enumerate the pernicious consequences resulting from that frantic inclination to distort the human frame: we may confidently assert, that Walzen is at present almost universally exploded in the cultivated circles of society among the Germans, who consider it as a dangerous and vulgar dance.

Violent dancing, especially in the heated atmosphere of a crowded assembly, produces a temporary fever, even in the by-standers, who inspire an air exceedingly vitiated by the breath of persons apparently in a semi-delirious trance, and by the suffocating vapour of candles. The blood is unnaturally propelled to the breast and head; hence arise frequent colds, coughs, and periodical headachs; perspiration is wantonly checked; the lungs are forcibly expanded, and the foundation is too often laid for that direful disease, consumption.

DA'NCER. *s.* (from *dance.*) One that practises the art of dancing (*Donne*).

Dancer (Rope), *schœnobates*, a person who walks, leaps, dances, and performs several other feats, upon a small rope or wire. The ancients had their rope-dancers as well as we. These had four several ways of exercising their art: the first vaulted, or turned round the rope like a wheel round its axis, and there hung by the heels or neck. The second flew or slid from above, resting on the stomach, with their arms and legs extended. The third ran along a rope stretched in a right line, or up and down. Lastly, the fourth not only walked on the rope, but made surprising leaps and turns thereon.

Dancers, in ecclesiastical history, a sect that sprung up at Aix-la-Chapelle in 1373, and spread through Flanders. Persons of both sexes were suddenly seized with dancing fits, and continued them, with extreme violence, till they were quite exhausted; and at these times they pretended to receive wonderful visions. The French prophets, or convulsionists, in later times, and some wild methodists in our own country, resembled these more ancient religious dancers.

DANCETTE', in heraldry, is when the outline of any bordure, or ordinary, is indented very largely; the largeness of the indentures *being the only thing that distinguishes it from* indented.

There is also a bearing of a bend, called double dancetté; thus, he beareth azure, a bend double dancetté argent.

DA'NCING-MASTER. *s.* (*dance* and *master.*) One who teaches the art of dancing (*Locke*).

DANCING-SCHOOL. *s.* The school where the art of dancing is taught (*L'Estrange.*)

DANDELI'ON. *s.* (*dent de lion,* French.) The name of a plant. See TARAXACUM.

DANDINI (Jerome), an Italian jesuit, born at Celena in 1554. He became a celebrated professor of philosophy, and was rector of several colleges. Clement VIII. sent him as his nuncio to the Maronites of Libanus. Of this journey he wrote an account, which was translated into French, and printed in 1675. He died at Forli in 1634. He wrote a Commentary on Aristotle's three books de Anima. (*Watkins*).

DANDINI (Pietro), a painter of Florence, born in 1646, and died in 1712. He was in the service of the grand-duke almost constantly, so that few of his pictures are to be found out of his own country. He was very successful in imitating great masters. (*Watkins*).

DANDINI (Cæsare), an historical painter, of Florence. He was uncle to the preceding. There are several noble pictures of his painting in the churches of Florence. (*Watkins*).

DANDINI (Hercule François), an Italian count and professor of law at Padua; born in 1691, and died in 1747. He wrote, 1. De Forensi scribendi ratione. 2. De servitutibus prædiorum interpretationes per epistolas, &c.

DA'NDIPRAT. *s.* (*dandin,* French.) A little fellow; an urchin.

To DA'NDLE. *v. a.* (*dandelen,* Dutch.) 1. To shake a child on the knee (*Temple*). 2. To fondle; to treat like a child (*Addison*). 3. To delay; to procrastinate (*Shakspeare*).

DA'NDLER. *s.* He that dandles or fondles children.

DA'NDRUFF. *s.* (ꞇan, the itch, and ꝺꞃoꝼ, sordid.) Scabs in the head. See PITIRIASIS.

DANEBERG, a town of Lower Saxony, in Germany, belonging to the elector of Hanover. Lat. 53. 4 N. Lon. 11. 29 E

DANEGELT, an annual tax laid on the Anglo-Saxons, first of 1*s.* and afterwards of 2*s.* for every hide of land through the realm, for maintaining such a number of forces as were thought sufficient to clear the British seas of Danish pirates, which heretofore greatly annoyed our coasts. Danegelt was first imposed as a standing yearly tax on the whole nation, under king Ethelred, A.D. 991.

DANE-WORT, in botany. See EBULUS.

DANGEAU (Lewis Courcillon de), a French abbot, who died at Paris in 1723, aged 80. He invented several games for teaching young persons geography, history, and grammar. He also wrote Dialogues on the Immortality of the Soul.

DANGEAU (Philip de Courcillon, marquis de), brother of the above, born in 1638, and died at Paris full of honours in 1720. He wrote Memoirs in MS. from which Voltaire and other authors have gleaned many curious particulars.

DA'NGER. *s.* (*danger,* French.) Risk; hazard; peril (*Acts*).

To DA'NGER. *v. a.* To put in hazard; to endanger (*Shakspeare*).

DANGER (Isles of), three islands in the S. Pacific ocean, seen by commodore Byron in 1765; but were so surrounded by rocks and breakers that it was unsafe to attempt to land. Lat. 10. 15 S. Lon. 169. 28 W.

DA'NGERLESS. *a.* (from *danger.*) Without hazard; without risk (*Sidney*).

DA'NGEROUS. *a.* (from *danger.*) Hazardous; perilous; full of danger (*Dryden*).

DA'NGEROUSLY. *ad.* Hazardously; perilously; with danger (*Hammond*).

DA'NGEROUSNESS. *s.* (from *dangerous.*) Danger; hazard; peril (*Boyle*).

To DA'NGLE. *v. n.* (from *hang.*) 1. To hang loose and quivering (*Smith*). 2. To hang upon any one; to be a humble follower (*Swift*).

DA'NGLER. *s.* (from *dangle.*) A man that hangs about women (*Ralph*).

DANICAN (Andre), better known by the name of Philidor; a celebrated player on chess. He was born at Paris, and resided for several years in England, where he published his Analysis du jeu des Echecs, in 1749. He also composed music with good success. He died in 1795.

DANIEL (judgment of God) the prophet, was descended from the royal family of David, and carried captive to Babylon when very young, A.M. 3398. In the captivity, Daniel eminently distinguished himself in the explanation of Nebuchadnezzar's dreams, and the handwriting against Belshazzar, and in his own escape from the lion's den. Here, likewise, he was favoured with many remarkable visions concerning future events. His prophecies concerning the Messiah, and other great events of aftertimes, are so clear and explicit, that Porphyry objected, that they must have been written after the facts had happened. The Jews do not reckon Daniel among the prophets, because he lived the life of a courtier rather than of a prophet; and because his revelations were not in the prophetic way, but by dream and vision in the night, which they consider as the lowest degree of revelation. But our Saviour, by acknowledging Daniel a prophet, Matt. xxiv. 15, puts his prophetic character beyond dispute. Among the prophets, says sir Isaac Newton, Daniel is most distinct in order of time, and easiest to be understood: and therefore, in things that relate to the last times, he must be made a key to the rest. All his prophecies relate one to another, as if they were but several parts of the same prophecy: the first is the easiest to be understood, and every following prophecy adds something new to the former. It is generally believed, that Daniel died in Chaldea, and that he did not avail himself of the permission granted by Cyrus to the Jews, of returning to their own country. Daniel's name is not prefixed to his book; yet, as Prideaux observes, the many passages, in which he speaks of himself in the first person, are sufficient proof that he was the author of it. The book of Daniel contains a history of many things done in the Babylonian and Persian empires; as well as a prophecy of things to be done, and many calamities to be executed, with a final deliverance to the glory of God's people. The style in which Daniel wrote is neither so lofty nor so figurative as that of the other prophets: it is, however, clear and concise, and his descriptions simple and natural; in short, his language is more like that of a historian than of a prophet. Part of the book of Daniel was originally written in the Chaldee language, viz. from chap. ii. 4. to the end of the vii. chap. it is supposed to be so written, on account of the Chaldean or Babylonish affairs which are treated of in that part. The rest of the book is in Hebrew.

Daniel (Samuel), an English poet and historian. He was born in Somersetshire, 1562, and educated at Magdalen college, Oxford; on leaving which, he became groom of the privy chamber to the queen of James I. At the close of his life he retired to his native country, where he died in 1619. His poems were collected, and printed in 2 vols. 12mo. 1718. He wrote the History of England to the end of the reign of Edward III. which, according to some authors, is the crown of all his works.

Daniel (Gabriel), a French historian. He was born at Roan in 1649, and entered among the jesuits at the age of 18. One of his first productions was a Voyage to the World of Cartesius, a work of great wit, and which has been translated into several languages. His greatest performance, however, is, The History of France, published at Paris in 3 vols. folio, 1713; but afterwards enlarged to 7 vols. 4to. 1722. He also wrote several miscellaneous and theological treatises. He died at Paris in 1728.

DANK, a Persian silver coin, weighing the 16th of a dram.

Dank. *a.* (from *tuncken*, German.) Damp; humid; moist; wet (*Milton*).

DA'NKISH, *a.* Somewhat dank (*Shak.*).

DANMONII, an ancient British nation, supposed to have inhabited that tract of country which is now called Cornwall and Devonshire, bounded on the south by the British ocean, on the west by St. George's channel, on the north by the Severn sea, and on the east by the country of the Durotriges. Some other British tribes were also seated within these limits; as the Cossini and Ostidamnii, who were probably particular clans of the Danmonii; and, according to Mr. Baxter, they were the keepers of their flocks and herds. As the several tribes of the Danmonii submitted without much resistance to the Romans, and never joined in any revolt against them, that people were under no necessity of building many forts, or keeping many garrisons in their country. This is the reason why so few Roman antiquities have been found there, and so little mention is made of it and its ancient inhabitants by Roman writers.

DANNENBERG, or **Danneberg**, a town of Germany, in the circle of Lower Saxony, and capital of a county of the same name, in the principality of Luneberg, on the Jetze Beer is the principal article of commerce. The number of inhabitants about 1000.

DANTE, a famous Italian poet, born at Florence in 1265. Dante was of an ambitious turn, and joined one of the factions which then disturbed Florence: but the party to which he belonged proving the weakest, he was banished. He then prevailed on the prince of Verona to make war on the Florentines, which did not answer his expectations; neither could he get himself recalled. He died at Ravenna in 1321. He wrote in his exile a triple poem called Divina Commedia, on Paradise, Purgatory, and Hell, which shews a wonderful imagination; but the satirical spirit which he breathes is very bitter. He attacks the city of Florence the French king, and the pope, in it, with great virulence, as the authors of his misfortunes; whereas, they proceeded from his own turbulent disposition. His works were printed at Venice in 1564, in folio: but the Commedia is the work to which he owes his celebrity. Mr. Boyd's translation of the Inferno, Purgatorio, and Paradiso, has been much admired.

Dante (Peter Vincent), a native of Perouse, who imitated the style of the preceding poet with so much success, that his performances have frequently gone under his name. He was also a good mathematician, and died in 1522.

DANTZIC, the metropolis of the palatinate of Pomerania, in Poland. It is the see of a bishop, and the seat of an university. It is one of the greatest granaries in the world; for upwards of 700,000 tons of corn are annually exported from this place alone. It contains about 200,000 inhabitants, who are for the most part Lutherans. Dantzic was a kind of republic, and its jurisdiction extended about 50 miles round it; the inhabitants maintained a strong garrison at their own expence; but, alas! so anxious are some princes to get possession of the territories of their neighbours, that the king of Prussia, partly by intrigue, and partly by force, annexed to his own dominions Dantzic with its territory in the spring of 1793. It is 160 miles W. by N. of Warsaw. Lat. 54. 22 N. Lon. 18. 37 E.

DANUBE, the largest river in Europe, rising at Doneschingen, in the Black Forest, in the circle of Suabia, in Germany; and running N. E. through Suabia, by Ulm, the capital of that country; and then E. through Bavaria and Austria, passes by Ratisbon, Passau, Ens, and Vienna. It then enters Hungary, and runs S. E. from Presburg to Buda, and so on to Belgrade; after which it divides Bulgaria from Morlachia and Moldavia, discharging itself by several channels into the Black sea, in the province of Bessarabia. It was called the Ister by the ancients. It begins to be navigable for boats at Ulm, and receives several large rivers as it passes along. It is so deep between Buda and Belgrade, that the Turks and Germans have had men of war upon it; and yet it is not navigable to the Black sea, on account of the cataracts.

DANVILLE, a town of United America, in the state of Kentucky: thirty-three miles SSE. of Frankfort.

DANVOU, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Vire: six leagues S. Bayeux.

To DAP. *v. n.* (corrupted from *dip.*) To let fall gently into the water (*Walton*).

DAPA'TICAL. *a.* (from *dapaticus*, Latin.) Sumptuous in cheer (*Bailey*).

DAPHNE, in fabulous history, the daughter of the river Peneus, who being beloved by Apollo, and flying from him to preserve her chastity, was, on her intreaties, changed into a laurel, whose leaves Apollo immediately consecrated to bind his temples, and made that tree the reward of poetry.

DA'PHNE. Spurge-laurel. In botany, a genus of the class octandria, order monogynia. Calyx four-cleft, resembling a corol, withering but permanent, enclosing the stamens; corolless; berry one-seeded. Thirty species, chiefly European, many Asiatic: some of which have lateral and some terminal flowers. The following are those chiefly worth noticing.

1. D. mezereon. Common mezereon or spurge-olive; a low deciduous shrub, found in the woods of Germany, and of our own country; with sessile flowers in threes on the stem, leaves lanceolate. Its seeds are denominated in the dispensatories coccognidia: grana cnidia: COCCI CNIDII, which see. There are four varieties of this elegant plant; all of which are common to our flower and shrub gardens, and have the multiform boast of offering an exquisite perfume along with a beautiful flower, and both so early in the year, as to anticipate almost every other flower: the corol appearing generally in February and often in January. Independently of which, the berries which succeed the flowers are in themselves of captivating hue and lustre, and continue through the whole of the summer.

2. D. thymelæa. Milk-wort-leaved daphne, a native of Spain, with sessile axillary flowers; leaves lanceolate; branches quite simple: a deciduous shrub, about a yard in height; the flowers appear in March, of a greenish hue; and are succeeded by yellow berries.

3. D. laureola.* Common spurge-laurel, or ever-green daphne. Found in our own woods, as also in those of Germany and Switzerland; bearing axillary, five-flowered racemes, with glabrous lanceolate leaves. The flowers appear in January and continue till April, and are accompanied with a pleasant perfume.

4. D. cnidium or gwidium. The thymelæa of Gerard. Flax-leaved daphne: with terminal panicled racemes; leaves linear, lanceolate, cuspidate, with a point. A low deciduous shrub of Italy and Spain, sometimes rising to a yard in height. In our own country the flowers do not appear till June, and are rarely followed by seeds.

5. D. cneorum. Spear-leaved daphne; a deciduous shrub of the south of Europe, rising about a foot and a half high: with fascicled, terminal, sessile flowers, red or white; leaves lanceolate, naked, mucronate.

6. D. alpina. Alpine daphne or chamelæa. A native of Italy and the Alps, rising to about a yard in height, with sessile, aggregate, lateral flowers, appearing in March, fragrant in odour; succeeded by red berries that ripen in September.

7. D. odora. Odorous daphne; so named from the exquisite perfume of its flower, which exceeds all the rest of the tribe. It is a native of China and Japan, with a many flowered, terminal, nearly sessile head of flowers, and scattered, oblong-lanceolate, glabrous leaves. In this country it must be cultivated as a green-house plant.

For the medical virtues of the root of the daphne mezereum, see MEZEREUM, under which name it is most known officinally. These plants should be differently raised, according to the different kinds: the mezereon and its varieties are best propagated by sowing the seeds or berries as soon as they become perfectly ripe, which is about August, on beds of light sandy earth. In these beds the young plants may remain till the beginning of the second autumn; when they should be removed, and set out in nursery-rows, at the distance of a foot and a half, and ten or twelve inches in the rows. After having been two years in this situation they are in a proper condition for being planted out where they are to remain

Most of the other species may be increased both by seeds and layers of the young shoots, or by cuttings. The layers or cuttings should be laid down or planted out in the beginning of the autumn. The last sort can only be propagated by seeds, obtained from its native situation, sown on a gentle hot-bed in the spring or autumn; the young plants being afterwards placed in a green-house.

DAPHNEPHORIA, a festival in honour of Apollo, celebrated every ninth year by the Bœotians. It was then usual to adorn an olive bough with garlands of laurel and other flowers, and place on the top a brazen globe, on which were suspended smaller ones. In the middle were placed a number of crowns, and a globe of inferior size, and the bottom was adorned with a saffron-coloured garment. The globe on the top represented the sun or Apollo. That in the middle was an emblem of the moon, and the other of the stars. The crowns, which were 365 in number, represented the sun's annual revolution. This bough was carried in solemn procession by a beautiful youth of an illustrious family, and whose parents were both living. The youth was dressed in rich garments which reached to the ground, his hair hung loose and dishevelled, his head was covered with a golden crown, and he wore on his feet shoes called Iphicratidæ, from Iphicrates an Athenian, who first invented them. He was called Δαφνηφορος, laurel bearer; and at the time he executed the office of priest of Apollo. He was preceded by one of his nearest relations, bearing a rod adorned with garlands, and behind him followed a train of virgins with branches in their hands. In this order the procession advanced as far as the temple of Apollo, surnamed Ismenius, where supplicatory hymns were sung to the god.

DAPIFER, the dignity or office of grand-master of a prince's household. The word literally signifies a dish-carrier. At the coronation of the emperor of Germany, the arch-dapifer carries the first dish of meat to table on horseback.

DA'PPER. *a.* (*dapper*, Dutch.) Little and active; lively without bulk (*Milton*).

DA'PPERLING. *s.* A dwarf (*Ainsworth*).

DAPPLE. Horses are so called which have partial variegated hues in the coat, of different sizes, constituting small circles, both lighter and darker than the general colour of the horse. Hence we have dapple bays, dapple greys, and sometimes dapple blacks.

To **DA'PPLE.** *v. n.* To streak; to vary (*Bacon*).

DAR. *s.* A fish; being the dace.

DARAH, or DRAS, a river of Africa, which rises in the greater Atlas, not far from Tefza, and runs into the Atlantic, near Cape Non.

DARAH, or DRAS, a country of Africa, bounded on the north by Morocco, Gezula, and Tafilet, on the east and the south by Zahara, and on the west by Sus, and takes its name from the river Darah, or Dras, which passes through it: the principal produce is indigo and dates: the inhabitants are Arabians and Mahometans.

DARCY (Count), an ingenious philosopher and mathematician, was born in Ireland in the year 1725; but his friends being, like many other great and good families at that period, attached to the house of Stuart, he was at 14 years of age sent to France, where he spent the rest of his life. Giving early indications of a genius for science, he was put under the care of the celebrated Clairaut, under whose tuition he improved so rapidly in the mathematics, that at 17 years of age he gave a new solution of the problem concerning the curve of equal pressure in a resisting medium. This was followed the year after by a determination of the curve described by a heavy body, sliding by its own weight along a moveable plane, at the same time that the pressure of the body causes a horizontal motion in the plane.

Though Darcy served in the war of 1744, he found leisure, during the bustle of a military life, to send two memoirs to the academy: the first of these contained a general principle in mechanics, that of the preservation of the rotatory motion; a principle which he again brought forward in 1750, by the name of the principle of the preservation of action. He was taken prisoner in this war by the English; and such was either the respect paid to science, or the mercy of the cabinet of St. James's, that he was treated, not as an Irish rebel, but as a French subject fighting for his king and his country.

In 1760, Darcy published An Essay on Artillery, containing some curious experiments on the charges of gunpowder, &c. &c. and improvements on those of the ingenious Robins; a kind of experiments which our author carried on occasionally to the end of his life. In 1765, he gave to the public the most ingenious of all his works, his Memoir on the Duration of the Sensation of Sight; in which he endeavours to prove, and indeed completely proves, that a body may sometimes pass by our eyes without producing a sensation attended with consciousness of marking its presence, otherwise than by weakening the brightness of the object which it may chance to cover in its passage. If, in this work, he shall be thought to have taken hints from Dr. Hartley, it is not perhaps too much to say, that some of our most celebrated writers on vision have since been beholden to Darcy. No man, indeed, has cause to be ashamed of being indebted to him; for all his works display, in an eminent degree, the union of genius and philosophy; but as he measured every thing upon the largest scale, and required extreme accuracy in experiment, neither his time, fortune, nor avocations, allowed him to execute more than a very small part of what he projected.

In his disposition, Darcy was amiable, spirited, lively, and a lover of independence; a passion to which he nobly sacrificed, even in the midst of literary society. He died of a cholera morbus in 1779, at 54 years of age. He was admitted of the French academy in 1749, and was made pensioner-geometrician in 1770. His essays, printed in the Memoirs of the Academy of Sciences, are various and very ingenious, and are contained in the volumes for the years 1742, 1747, 1749, 1750, 1751, 1752, 1753, 1754, 1758, 1759, 1760, 1765, and in tom. 1. of the Savans Etrangers.

DARAPTI, among logicians, one of the modes of syllogisms of the third figure, whose premises are universal affirmatives, and the conclusion is a particular affirmative: thus,

DAR- Every body is divisible;
AP- Every body is a substance;
TI. Therefore some substance is divisible.

DARDANARIUS. Usurer, monopolist. A name anciently attributed to such as caused a scarcity, and dearness of provisions, particularly corn, by buying it and hoarding it up, to raise its value, and sell it again at an extravagant rate.

DARDANELLES, two castles of Turkey; the one, called Sestos, seated in Romania; the other, called Abydos, in Natolia. They command the S. W. entrance of the strait of Gallipoli, the ancient Hellespont. At Abydos, the cargoes of all ships sailing from Constantinople are searched. Lat. 40. 0 N. Lon. 26. 30 E.

To **DARE.** *v. a. pret.* I durst; *part.* I have dared. (ꝺeaꞃꞃan, Saxon.) To have courage for any purpose; not to be afraid; to be adventurous (*Dryden*).

To DARE. *v. a. pret. I* dared. To challenge; to defy (*Roscommon*).

To DARE LARKS. To catch them by means of a looking-glass (*Carew*).

DARE. *s.* Defiance; challenge (*Shaks.*).

DA'REA, in botany, a genus of the class cryptogamia, order filices. Fructification in scattered, nearly marginal lines: involucre originating laterally from a vein opening towards the margin. Nine species.

DA'REFUL. *a.* (*dare* and *full.*) Full of defiance: not in use (*Shakspeare*).

DARENT, a river of England, in the county of Kent, which runs into the Thames, three miles N. Dartford. The mouth near the Thames is called Dartford Creek.

DAR-FUR, a country in the interior part of Africa, extending, according to Mr. Brown's map, from about 11 to 15. 20 N. lat., and in its greatest breadth from 26 to 29. 15 E. lon. The capital of the country is called Cobbé. For a minute description of this country, the reader may consult Brown's Travels in Africa, &c. from the year 1792 to 1798.

DARIC, in antiquity, a famous piece of gold, first coined by Darius the Mede, about 538 years before Christ; probably during his stay at Babylon. From thence it was dispersed over the east, and also into Greece; so that the Persian daric, which was also called stater, was the gold coin best known in Athens in ancient times. According to Dr. Bernard, it weighed two grains more than one of our guineas; but as it was very fine, and contained little alloy, it may be reckoned worth about 25*s.* of our money.

DARIEN, or the isthmus of PANAMA, a narrow neck of land, which joins North to South America. It is also the name of a province of Terra Firma, and lies in the form of a crescent about the Bay of Panama. This province is not the richest, though it is of the greatest importance to Spain, and has been the scene of more actions than any other place in the whole continent of America. The immense treasures of Peru are brought hither, and thence exported to Europe. This circumstance has induced many enterprising people to make attempts on Panama, Porto Bello, and other towns of this province, in hopes of obtaining a considerable booty.

DARIEN, in Georgia, North America, so called by the Scots Highlanders, who settled there in 1736. This settlement is by the side of the river Alatamala, about 18 miles from the sea, where they raised a fort, &c.

DARII, in logic, one of the modes of syllogism of the first figure, wherein the major proposition is an universal affirmative, and the minor and conclusion particular affirmatives: thus,

DA- Every thing that is moved is moved by another;
RI- Some body is moved:
I. Therefore some body is moved by another.

DA'RING. *a.* (from *dare.*) Bold; adventurous; fearless; courageous (*Prior*).

DA'RINGLY. *ad.* Boldly; courageously; fearlessly (*Halifax*).

DA'RINGNESS. *s.* (from *daring.*) Boldness.

DARIUS, a noble satrap of Persia, son of Hystaspes; who conspired with six other noblemen to destroy Smerdis, who usurped the crown of Persia after the death of Cambyses. On the murder of the usurper, the conspirators agreed, that he whose horse neighed first should be appointed king. The groom of Darius previously led his master's horse to a mare, at a place near which the seven noblemen were to pass. On the morrow before sun-rise, when they proceeded all together, the horse recollecting the mare, suddenly neighed. The noblemen dismounted from their horses, and saluted Darius king. Darius was 29 years old when he ascended the throne, and he soon distinguished himself by his military accomplishments. He besieged Babylon, which he took, after a siege of 20 months. From thence he marched against the Scythians, and in his way conquered Thrace, but after several disasters in the wilds of Scythia, retired with shame, and turned his arms against the Indians, whom he subdued. The burning of Sardis, a Grecian colony, incensed the Athenians, and a war was kindled between Greece and Persia, and Mardonius, the king's son-in-law, was entrusted with the care of the war, but his army was destroyed by the Thracians; and Darius, more animated by his loss, sent a more considerable force, under the command of Datis and Artaphernes. They were conquered at the celebrated battle of Marathon, by 10,000 Athenians; and the Persians lost in that expedition no less than 200,000 men. Darius then resolved to carry on the war in person, and immediately ordered a still larger army to be levied: he died in the midst of his preparations, B.C. 485, after a reign of 36 years, in the 65th year of his age. (*Herodot. Justin.* &c.) The second king of Persia of that name was called Ochus or Nothus, because he was the illegitimate son of Artaxerxes, by a concubine. He carried on many wars with success, under the conduct of his generals, and of his son Cyrus. He died B.C. 404, after a reign of 19 years, and was succeeded by his son Artaxerxes. (*Justin*, &c.) The third of that name was the last king of Persia, surnamed Codomanus. He was the son of Arsaces and Sysigambis, and descended from Darius Nothus. The eunuch Bagous raised him to the throne, but afterwards prepared to poison him. Darius discovered his perfidy, and made him drink the poison which he had prepared against his life. The peace of Darius was early disturbed by Alexander, who invaded Persia to avenge the injuries which the Greeks had suffered from the predecessors of Darius. The king of Persia met his adversary in person, at the head of 600,000 men. This army was remarkable more for its opulence and luxury, than for military courage. With these forces Darius met Alexander. A battle was fought near the Granicus, in which the Persians were easily defeated. Another was soon after fought near Issus; and Alexander left 110,000 of the enemy dead in the field of battle, and took among the prisoners of war, the mother, wife, and children of Darius. The darkness of the night favoured the retreat of Darius, who saved himself by flying in disguise. These losses weakened, but discouraged not Darius: he assembled another more powerful army, and the last decisive battle was fought at Arbela. The victory was long doubtful; but the intrepidity of Alexander, and the superior valour of the Macedonians, prevailed over the effeminate Persians; and Darius, sensible of his ruin, fled towards Media. His misfortunes were now increased. Bessus, the governor of Bactriana, took away his life, in hopes of succeeding him on the throne; and Darius was found by the Macedonians in his chariot, covered with wounds, and almost expiring, B.C. 331. In him the empire of Persia was extinguished 228 years after it had been first founded by Cyrus the Great.

DARK. *a.* (ꝺeoꞃc, Saxon.) 1. Not light; wanting light (*Waller*). 2. Not of a showy or vivid colour (*Boyle*). 3. Blind; without the enjoyment of light (*Dryden*). 4. Opake; not transparent. 5. Obscure; not perspicuous (*Hooker*). 6. Not enlightened by knowledge; ignorant (*Denham*). 7. Gloomy; not cheerful (*Addison*).

DARK. *s.* 1. Darkness; obscurity; want of light (*Shakspeare*). 2. Obscurity; condition of one unknown (*Atterbury*). 3. Want of knowledge (*Locke*).

To DARK. *v. a.* (from the noun.) To darken; to obscure: obsolete (*Spenser*).

DARK-CHAMBER. See CAMERA OBSCURA.

To DA'RKEN. *v. a.* (from *dark*). 1. To make dark; to deprive of light (*Addison*). 2. To cloud; to perplex (*Bacon*). 3. To foul; to sully (*Tillotson*).

To DA'RKEN. *v. n.* To grow dark.

DARKING, or DORKING, a town in Surry, with a market on Thursdays. Lat. 51. 17 N. Lon. 0. 14 W.

DA'RKLING. (a kind of diminutive from *dark.*) Being in the dark (*Shakspeare*).

DA'RKLY. *ad.* (from *dark.*) In a situation void of light; obscurely; blindly (*Dryden*).

DA'RKNESS. *s.* (from *dark.*) 1. Absence of light (*Genesis*). 2. Opakeness; want of transparency. 3. Obscurity; want of perspicuity. 4. Infernal gloom; wickedness (*Shakspeare*). 5. State of being intellectually dark; ignorance; uncertainty (*Locke*). 6. The empire of Satan (*Colossians*).

DA'RKSOME. *a.* (from *dark.*) Gloomy; obscure; not luminous (*Pope*).

DA'RLING. *a.* (ꝺeoꞃlinᵹ, Saxon.) Favourite; dear; beloved (*L'Estrange*).

DA'RLING. *s.* A favourite; one much beloved (*Halifax*).

DARLINGTON, a town in the county of Durham, with a market on Mondays. It contains 4670 inhabitants; has a manufacture of huckabacks and camlets; and is seated on the Skerne, over which is a long stone bridge. Lat. 54. 32 N. Lon. 1. 25 W.

DARMSTADT, a town of Hesse Darmstadt, in the upper circle of the Rhine, Germany. Lat. 49. 43 N. Lon. 8. 40 E.

To DARN. *v. a.* (See DEARN.) To mend holes by imitating the texture of the stuff (*Gay*).

DARNEL, in botany. See LOLIUM.

To DA'RRAIN. *v. a.* 1. To range troops for battle (*Carew*). 2. To apply to the sight (*Spenser*).

DART. *s.* (*dard*, French.) A missile weapon thrown by the hand (*Shakspeare*).

DART, in astronomy and geometry. See SAGITTA.

To DART. *v. a.* (from the noun.) 1. To throw offensively (*Dryden*). 2. To throw; to omit (*Pope*).

To DART. *v. n.* 1. To fly as a dart (*Shakspeare*). 2. To let fly with hostile intention (*Shakspeare*).

DART, a riven in Devonshire, which rises at the foot of Dartmoor hills, crosses Dartmoor to Ashburton, and after passing Totness, where it is navigable for small vessels, is joined by the Harebourn, and falls into the English channel at Dartmouth.

DARTER, in ornithology. See PLOTUS.

DARTFORD, in geography, a market town in Kent, having a market on Saturdays. It is situated on the Dover road, about 15 miles from London. The inhabitants amount to more than 2400: the principal manufactories are gunpowder and paper.

DARTMOOR, an extensive moorish tract, in Devonshire, bounded on the N. by bleak hills, and extending southward quite through the centre of the county to the sea. It contains about 80,000 acres, and is watered by the river Dart. Many sheep are bred here, but of a small kind, and subject to the rot. The chief riches of the inhabitants are their black cattle, which thrive well on the coarse sour herbage. On this moor there are just erected large prisons, from the designs of Mr. D. Alexander, a well-known scientific architect, for the reception of persons captured in time of war. A view of these prisons is given in Vancouver's History of Devonshire.

DARTMOUTH, a seaport town of England, situated at the mouth of the Dart, on the English channel; said to have been formerly called Clifton. It is an ancient corporation, and a borough town, sending two members to the British parliament. The harbour is safe, and large enough to contain 500 ships. Here live several considerable merchants, who send out vessels to Newfoundland for fish, which they dispose of in Italy, Spain, Portugal, &c. loading back with wine, fruit, oil, &c. It has a weekly market on Friday, for corn and provisions, and one almost every day for fish: thirty-one miles S. Exeter, and 204 W.S.W. London. Lon. 3. 35 W. Lat. 50. 17 N.

Dartmouth, a town of United America, in the state of New Hampshire: 100 miles N.W. of Boston. Lon. 72. 13 W. Lat. 43. 15 N.

DARWIN (Erasmus, M.D.), a celebrated physician, philosopher, and poet, was born at Elston, near Newark, in Nottinghamshire, Dec. 12, 1731. He received his early education at Chesterfield school, and was from thence removed to St. John's college, Cambridge: being intended for the medical profession, he took the degree of M.B. in 1755, defending in his thesis an opinion that the motion of the heart and arteries is produced by the stimulus of the blood. After he left college he attended the lectures of Dr. Hunter, and then went through a diligent course of study at Edinburgh. He first settled as a physician at Nottingham; but meeting with little success he soon removed to Litchfield, where he resided many years, enjoying a very extensive reputation and a very profitable practice. In the year 1757 he married Miss Mary Howard, daughter of Charles Howard, esq.: by this lady he had five children, two of whom died young; she died in 1770. Soon after the decease of his wife, Dr. Darwin commenced his laborious work the Zoonomia, which, however, he did not think proper to publish till about 1794. In the year 1780 he married Mrs. Pole, the relict of colonel Pole, of Radbourne-hall, near Derby; which occasioned his removal, first to Radbourne, and thence to Derby, where he resided till within a few months of his death. He died April 18th, 1802, at Breadwall Priory, in the 71st year of his age. Besides the Zoonomia, or Laws of Organic Life, in 2 vols. 4to. the doctor published, The Loves of the Plants; The Botanic Garden; The Phytologia, and a Plan for Female Education in Boarding-schools; he also communicated various papers to the Philosophical Transactions, and published some lighter works which need not here be enumerated. Dr. Darwin displayed much learning, taste, and genius, in his different performances; but almost all his powers were subjected to his fancy, which indeed often led him to adopt the most romantic and singular, and sometimes dangerous, opinions. There was one great end, we are told, to the attainment of which all his talents and views were earnestly and uniformly directed. He did not hesitate openly and repeatedly to declare in public company, that the acquisition of wealth was the leading object of all his literary undertakings! He once said to a friend: "I have gained 900*l.* by my Botanic Garden, and 900*l.* by the 1st volume of Zoonomia; and if I can every other year produce a work which will yield this sum, I shall do very well. Money, and not fame, is the object I have in view in all my publications." Those who wish to see a complete refutation of the sophisms contained in the Zoonomia will read with pleasure, Observations on the Zoonomia of Dr. Darwin, by Thomas Brown, esq. See also, for an examination of the nature of his poetry, and the tendency of his philosophy, the account of his Temple of Nature, in No. 4 of the Edinburgh Review. In the 7th No. of the same Review, in a critique on Miss Seward's Memoirs of Dr. Darwin, reference is made to an anonymous philosophical poem called Universal Beauty, published in 1735, which is stamped incontrovertibly with all the peculiar characters of what has since been called the Darwinian school.

DARWINIAN THEORY. As we have given a distinct article to the theory of Dr. Brown under the title of Brunonian Theory, we are compelled in point of consistency, to devote a similar article to that of Dr. Darwin. Yet the resemblance between the two is so considerable that having already stated the former, the latter may be discussed in very few words. In reality Darwin himself was fond of commenting upon this similarity, though he was far from relinquishing the originality of his own pretensions: it was his common boast that he was a Brunonian before ever Brown had published a syllable.

The attempt of Darwin was to include in one scheme both general principles and particular facts; and to trace the excitability of the Brunonian theory, and which its author only contemplated as an ultimate resting place, to its actual origin. The excitability of Brown is in the Darwinian dialect denominated sensorial power or spirit of animation; and is conceived to be "a subtile fluid residing in the brain and nerves, and liable to general or partial accumulation." The vital changes effected by this imaginary fluid are;

1st. *Irritation*; "which is an exertion or change of some extreme part of the sensorium residing in the muscles or organs of sense, in consequence of the appulses of external bodies."

2d. *Sensation*; which is "an exertion or change of the central parts of the sensorium or of the whole of it, beginning at some extreme parts of it which reside in the muscles or organs of sense."

3d. *Volition*; "an exertion or change of the central parts of the sensorium or of the whole of it, terminating in some extreme parts of it which reside in the muscles or organs of sense."

4th. *Association*, "an exterior or change of some extreme part of the sensorium, residing in the muscles or organs of sense in consequence of some antecedent or attendant fibrous contractions."

With these assumptions as his guide, Darwin endeavoured to penetrate deeper into the cause of disease than is allowed by a mere knowledge of the condition of the fibre. The powers of the sensorium are the proximate cause; the fibrous action, the excitement of Brown, the proximate effect. And hence by means of an ingenious but highly unsatisfactory statement of the mode by which excitations are produced, he treats of diseases as occasioned by the comparative redundancy, or deficiency of the sensorial power of *irritation*, *sensation*, *volition*, or *association*; these four terms constituting the four classes into which he divides his nosology, and the two opposite measures of *redundancy* and *deficiency*, the two orders of which each class; excepting indeed the last, which is differently divided, consists.

The grand errors in this theory proceed from its not sufficiently distinguishing between cause and effect, between the motion and its source; in substituting mere statements of phenomena for explanations of their origin; and, what is of far more consequence, in attempting to divide that which in itself is in divisible.

Plausible and even splendid therefore as this theory is to the superficial observer, it has already fallen a sacrifice to these radical defects, and may almost be said to have been buried in the same grave with its author. Yet how different was the result to which the author himself looked forward! It is thus he concludes his Zoonomia, which he flattered himself would have lived as long as the earth, and have been diffused to as great an extent. "Thus have I given an outline of what may be termed the sympathetic theory of fevers, to distinguish it from the mechanic theory of Boerhaave, the spasmodic theory of Hoffman, and of Cullen, and the putrid theory of Pringle. What I have thus delivered, I beg to be considered rather as observations and conjectures, than as things explained and demonstrated; to be considered as a foundation and a scaffolding, which may enable future industry to erect a solid and a beautiful edifice, eminent both for its simplicity and utility, as well as for the permanency of its materials—which may not moulder, like the structures already erected, into the sand of which they were composed; but which may stand unimpaired, like the Newtonian philosophy, a rock amid the waste of ages"!

To DASH. *v. a.* (etymology doubtful.) 1. To throw or strike any thing suddenly against something (*Tillotson*). 2. To break by collision (*Shakspeare*). 3. To throw water in flashes (*Mortimer*). 4. To bespatter; to besprinkle (*Shakspeare*). 5. To agitate any liquid, so as to make the surface fly off. 6. To mingle; to adulterate (*Hudibras*). 7. To form or sketch in haste, carelesly (*Pope*). 8. To obliterate; to blot; to cross out (*Pope*). 9. To confound; to make ashamed suddenly; to depress; to suppress (*Pope*).

To DASH. *v. n.* 1. To fly off the susface by a violent motion (*Cheyne*). 2. To fly in flashes with a loud noise (*Thomson*). 3. To rush through water, so as to make it fly (*Dryden*).

DASH. *s.* (from the verb.) 1. Collision (*Thomson*). 2. Infusion (*Addison*). 3. A mark in writing; a line (*Brown*). 4. Stroke; blow: ludicrous (*Shakspeare*).

DASH. *ad.* An expression of the sound of water dashed (*Dryden*).

DASSEN EYLAND, or the ISLE of DEER, one of three small islands to the N. of the Cape of Good Hope. Here are sheep whose tails on an average weigh 18 pounds. Lat. 33. 25 S. Lon. 18. 7 E.

DA'STARD. *s.* (aꝺaꞅꞇꞃiᵹa, Saxon.) A coward; a poltroon (*Locke*).

To DA'STARD. *v. a.* To terrify; to intimidate; to desert with cowardice (*Dryden*).

To DA'STARDISE. *v. a.* (from *dastard.*) To intimidate; to deject with cowardice (*Dryden*).

DA'STARDLY. *a.* (from *dastard.*) Cowardly; mean; timorous (*L'Estrange*).

DA'STARDY. *s.* Cowardliness; timorousness.

DASYPHUS. Armadillo. In zoology, a genus of the class mammalia, order bruta. Tuskless; grinders short, cylindrical; in each jaw seven or eight: body covered with a bony shell intersected by zones. Ten species: all natives of South America; yet one, d. septemcinctus, found also in India. They feed on roots, melons, potatoes, flesh, fishes, insects and worms; rest by day, and wander about by night; burrow in the ground; are gentle; defend themselves by rolling into a globular form; the females produce monthly: flesh eatable. They are distinguished into species by the number of bands they possess around their body; the shell, or very curious and complete coat of armour, being in this manner peculiarly and most beautifully divided: and in every instance affording so perfect a coat of armour, that when they are completely coiled up, they are almost beyond the reach of danger. The following may serve as examples.

1. D. tricinctus. Three-banded armadillo. Bands three, moveable; toes five; scales knobbed on the surface; eyes small; ears rounded, short; head oblong, covered by a helmet of one piece; two middle claws of the fore-feet large, length a foot. Inhabits Brazil: feeds on fruit and poultry.

2. D. octocinctus. Eight-banded armadillo. Bands eight; shields two, sprinkled with prominal white knobs; bands spotted triangularly; back iron-grey; sides whitish-grey, spotted with iron-grey; belly whitish. Inhabits Brazil; flesh delicious.

3. D. longicaudus. Long-tailed armadillo. Bands nine; tail long, jointed. Inhabits America; about the size of a cat. See Nat. Hist. Pl. LXXI.

DATA, among mathematicians, a term for such things or quantities as are given or known, in order to find other things thereby that are unknown. Euclid uses the word *data* for such spaces, lines and angles as are given in magnitude, or to which we can assign others equal. From the primary use of the word *data* in mathematics, it has been transplanted into other arts; as philosophy, medicine, &c. where it expresses any quantity, which, for the sake of a present calculation, is taken for granted to be such, without requiring an immediate proof for its certainty; called also the given quantity, number, or power. And hence also such things as are known, from whence either in natural philosophy, the animal mechanism, or the operation of medicines, we come to the knowledge of others unknown.

are now frequently in physical writers called *data*.

DATA OF EUCLID, the first in order of the books that have been written by the ancient geometricians, to facilitate and promote the method of resolution or analysis. In general, a thing is said to be given which is either actually exhibited, or can be found out, that is, which is either known by hypothesis, or that can be demonstrated to be known: and the propositions in the book of Euclid's data shew what things can be found out or known, from those that by hypothesis are already known: so that in the analysis or investigation of a problem, from the things that are laid down as given or known, by the help of these propositions, it is demonstrated that other things are given, and from these last that others again are given, and so on, till it is demonstrated that that which was proposed to be found out in the problem is given; and when this is done, the problem is solved, and its composition is made and derived from the compositions of the data which were employed in the analysis. And thus the data of Euclid are of the most general and necessary use in the solution of problems of every kind.

Marinus, at the end of his preface to the data, is mistaking in asserting that Euclid has not used the synthetical, but the analytical method in delivering them: for though in the analysis of a theorem, the thing to be demonstrated is assumed in the analysis; yet in the demonstrations of the data, the thing to be demonstrated, which is, that something is given, is never once assumed in the demonstration; from which it is manifest, that every one of them is demonstrated synthetically: though indeed if a proposition of the data be turned into a problem, the demonstration of the proposition becomes the analysis of the problem. (*Simson's preface to his edition of the Data*).

DA'TARY. *s.* (*datarius.*) An officer of the chancery of Rome.

DATE. *s.* (*datte*, Fr. *datum*, Lat.) 1. The time at which a letter is written, marked at the end or the beginning. 2. The time at which any event happened. 3. The time stipulated when any thing shall be done (*Shakspeare*). 4. End; conclusion (*Pope*). 5. Duration; continuance (*Denham*).

To DATE. *v. a.* (from the noun.) To note with the time at which any thing is written or done (*Bentley*).

DATE-TREE. See PHŒNIX.

DATE-PLUM (Indian.) See DIOSPYROS.

DA'TELESS. *a.* (from *date.*) Without any fixed term (*Shakspeare*).

DATHOLITE. A translucent siliceous mineral, lately discovered by M. Esmark, at Ahrendal in Norway. Colour, greyish and greenish-white passing into mountain-green. Lustre, shining internally between vitreous and resinous. Fracture small, and imperfectly conchoidal. It is found in large masses, with coarse granular concretions; its more perfect crystals are small, regular, tetrahedral prisms, with truncated angles. It is very hard, and its specific gravity 2.98. According to Klaproth, the following is its composition:

36·5	silex.
35.5	lime.
24.	boracic acid.
4.	loss.
100.	

DATISCA. Bastard-hemp. In botany, a genus of the class diœcia, order dodecandria. Male: calyx five-leaved; corolless; anthers fifteen, long, sessile. Fem.: two-toothed; corolless; styles two; capsule inferior, three-sided, three-horned, one-celled, pervious, many-seeded. Two species.

1. D. cannabina; a native of Canada, with stem smooth.

2. D. hirta; a native of Pennsylvania, with rough, hairy stem.

DATISI, in logic, a mode of syllogisms in the third figure, wherein the major is an universal affirmative, and the minor and conclusion particular affirmative propositions. For example,

DA- All who serve God are kings;
TI- Some who serve God are poor;
SI. Therefore some who are poor are kings.

DATIVE, among grammarians, the third case in the declension of nouns. It is called dative, because usually governed by a verb implying something to be given to some person. In English, the dative is expressed by the signs *to* or *for*.

DATU'RA. Thorn-apple. In botany, a genus of the class pentandria, order monogynia. Corol funnel-form, plaited; calyx tubular, angular, deciduous: capsule superior, two-celled, four-valved. Seven species—scattered over the globe: of which the chief are,

1. D. stramonium. Common thorn-apple, found in the wastes of our own country, with spinous, erect, ovate pericarps; ovate, glabrous leaves. It rises about a yard high with a strong perpendicular, round, hollow, green stalk, branching luxuriantly, and to a great extent; at night the upper leaves become erect and inclose the flowers, which have sometimes a tinge of purple or violet. The flowers consists of one large funnel-shaped petal, succeeded by large roundish capsules of the size of middling apples, closely beset with sharp spines which constitute what is called the thorn-apple. For the medical virtues of this plant see STRAMONIUM; under which name it is usually designated in our pharmacopœ'as.

2. D. arborea. A tall tree of Peru, with glabrous leaves, hollow herbaceous stem; glabrous nodding pericarps without spines; large fragrant flowers.

DAVA'LLIA. In botany, a genus of the class cryptogamia, order filices. Fructification in roundish distinct dots near the margin; involucre membranaceous, from the surface half-hooded, distinct, somewhat truncate, opening towards the margin. Nineteen species.

To DAUB. *v. a.* (*dabben*, Dutch.) 1. To smear with something adhesive (*Exodus*). 2. To paint coarsely (*Otway*). 3. To cover with something specious or gross (*Shakspeare*). 4. To lay on any thing gaudily or ostentatiously (*Bacon*). 5. To flatter grossly (*South*).

To DAUB. *v. n.* To play the hypocrite (*Shakspeare*).

DAUBENTON (Lewis Mary), a celebrated naturalist, was born at Monbard in Burgundy, in May 1716. He studied medicine, and intended to follow that profession; but Buffon, being appointed intendant of the king's garden in 1735, proposed to Daubenton to reside with him, to apply to natural history, and to assist him in the grand labours which he was then about to undertake. In 1740, the fate and taste of Daubenton were determined for his whole life. More than half a century devoted to the formation of the cabinet of natural history (in 1750 merely a drug shop), which he arranged methodically and enriched with productions of every kind, has given him a distinguished rank among naturalists. Being admitted into the Academy of Sciences in 1744, he never ceased to enrich the collection of its memoirs with various papers, for nearly 50 years. The greater part of them contain new facts and ideas, respecting the classification of shells, on the hippopotamus, the shrew-mouse, bats, fossil-bones and teeth, the situation of the great foramen in man and animals, rumination and the temperament of sheep, descriptions of various animals little known, &c. He died at Paris, January 1, 1800. His funeral was attended by more than 400 persons.

DA'UBER. *s.* (from *daub.*) A coarse low painter (*Swift*).

DA'UBY. *a.* (from *daub.*) Viscous; glutinous; adhesive (*Dryden*).

DAUCUS. Carrot. In botany, a genus of the class pentandria, order digynia. Involucres pinnatifid; flowers somewhat radiating; florets of the centre abortive, fruit muricate. Six species—all exotics, and natives of the South of Europe, except

D. carota, or common carrot, which is indigenous to our own pastures, with bristly seeds; and peticles nerved underneath. The root is highly useful as well for fodder as for the table; concerning both, and especially the first, see HUSBANDRY. It has also been employed on account of the great quantity of saccharine matter it contains, both for sugar and for alkohol. It has not saccharine matter enough to render it ever an article that can vie even with the beet-root, much more with the sugar-cane; but it may be worked up, perhaps, with considerable advantage in distilleries, either alone, or in conjunction with malt.

DAVENANT (Sir William), an English poet. He was born in 1605 at Oxford, where his father kept an inn. The first part of his education he received at the grammar-school of that city, and then he was entered of Lincoln college. He did not remain long at the university, but became page to the duchess of Richmond, and afterwards to lord Brook. In 1628 he commenced author, and formed an intimacy with the first wits of the age. About this time he had the misfortune to lose his nose in consequence of an amour. He succeeded Ben Jonson as poet-laureat, and in 1643 he was knighted by Charles I. When the king's affairs declined he went to France and changed his religion, which recommended him to the patronage of the queen, who sent him to England to advise her husband to save himself by giving up the church, which so displeased him that he ordered Davenant never to come into his presence again. He was next engaged to convey a number of artificers from France to Virginia, but the ship was taken and carried to England, where he would have been certainly executed if Milton and some others had not interceded for his life. He now set up a sort of operas, to support himself, plays being forbidden; but at the restoration he obtained a patent for erecting a playhouse in Lincoln's-inn-fields. He died in 1668, and was interred in Westminster abbey. His works were published together in 1673, consisting of plays and poems (*Watkins*).

DAVENTRY, or DAINTRY, a borough town of Northamptonshire, having a market on Wednesdays. Lat 52. 15 N. Lon. 1. 10 W.

DA'UGHTER. *s.* (dauhtar, Gothick; dohter, Saxon; *dotter*, Runick.) 1. The female offspring of a man or woman. 2. A daughter in law, or son's wife. 3. A woman (*Genesis*). 4. (In poetry.) Any descendant. 5. The female penitent of a confessor (*Shakspeare*).

DAVID, king of Israel, born at Bethlehem, 1085 B.C. He was crowned, while a youth and a shepherd, by the prophet Samuel. His valour in killing Goliath procured him a place at the court of Saul, who afterwards endeavoured to take his life, on which David fled from place to place. When that prince fell, David was recognized king by the nation, which he governed with great glory; though the affair of Uriah has blackened his character. However he sorely repented of that crime, and suffered for it. His reign was disturbed by foreign wars, and more by a rebellion excited by his son Absalom, whose death he feelingly lamented. David, on the whole, was a great prince and a good monarch. He died in 1015 B.C. and in the 70th year of his age. A considerable part of the book of Psalms having been composed by him, occasions the whole to be called by his name. A fine history of the life of David was published by Dr. Delany, in 2 vols. 8vo. The doctor has very ably defended the character of the "man after God's own heart" against the objections of deistical cavillers. After rescuing the name of the Jewish prince from obloquy, Dr. Delany concludes with this impressive summary:

"Upon the whole, David's is a character which stands single in the accounts of the world; equally eminent, and unrivalled.

"For, not to insist upon his great personal accomplishments, such as beauty, stature, strength, swiftness, and eloquence; his character is sufficiently distinguished by the noblest qualities, endowments, and events.

"Exalted from an humble shepherd to a mighty monarch, without the least tincture of pride, disdain, or envy: quite otherwise; remarkably humble in exaltation; or rather, humbled by it. Exalted unenvied! Exalted himself, and equally exalting the state he ruled; raising it from contempt, poverty, and oppression, to wealth, dignity, and sway. A man experienced in every vicissitude of fortune and life, and equal to them all. Thoroughly tried in adversity, and tempted by success: yet still superior! Cruelly and unjustly persecuted; yet not to be provoked even to just revenge. In the saddest and suddenest reverse of fortune, depressed by nothing but the remembrance of guilt; and in consequence of that, unhumbled to any thing but God.

"To sum up all; a true believer, and zealous adorer, of God; teacher of his law and worship, and inspirer of his praise. A glorious example, a perpetual and inexhaustible fountain, of true piety. A consummate and unequalled hero, a skilful and a fortunate captain. A steady patriot, a wise ruler, a faithful, a generous, and a magnanimous friend: and, what is yet rarer, a no less generous and magnanimous enemy! A true penitent, a divine musician, a sublime poet, and an inspired prophet By birth a peasant, by merit a prince. In youth, a hero; in manhood, a monarch; in age, a saint!

"This is David. *What his revilers are, their own revilings tell.*"

David (St.), a native of Wales, and the tutelar saint of that country. He descended from the royal family of the Britons, being uncle to king Arthur, and was son of Xantus, prince of Ceretica, now Cardiganshire. He was brought up in the service of God, and being ordained priest, retired into the Isle of Wight, and embraced an ascetic life. He studied a long time to prepare himself for the functions of the holy ministry; at length, coming out of his solitude, like the Baptist out of the Desart, he preached the word of eternal life to the Britons. He founded twelve monasteries, the principal of which was in the vale of Ross, near Menevia, where he formed many great pastors, and eminent servants of God. By his rule he obliged all his monks to assiduous manual labour, and allowed them the use of no cattle in tilling the ground. They returned late in the day to the monastery; and these labours were never interrupted but by prayers and reading the Holy Scriptures, short repose, and moderate refreshment. Pelagianism springing up a second time in Britain, the bishops, in order to suppress it, held a synod at Brevy, in Cardiganshire. St. David, being invited to it, went thither, and in that venerable assembly confuted and silenced the doctrine, by his eloquence and learning. At the close of the synod, the archbishop of Caerleon resigned his see to St. David, whose tears and opposition were only to be overcome by the absolute command of the synod. He had, however, liberty to transfer his see from Caerleon, then a populous city, to Menevia, now called St. David's. Gyraldus adds, that St. David was the great ornament and pattern of his age. He spoke with great force and energy; but his example was more powerful than his eloquence, and he has in all succeeding ages been the glory of the British church. He continued in his last see many years, and died towards the latter end of the 6th century, in a very advanced age. He was buried in his church of St. Andrew, which hath since taken his name, with the town and whole diocese. His day (August 1), is kept as a festival through the whole principality, as well as by the natives of Wales who reside in London. (*Audley's Companion to the Almanack, pa.* 13).

David's (St) an episcopal town of Pembrokeshire, in South Wales. It was formerly an archiepiscopal see, and the metropolitan of the British church. The see was removed by David from Caerleon to St. David's, in 577; and lost its archiepiscopal power about 1115, when it became a suffragan to the see of Canterbury. Its annual value was estimated at 426*l*. 2*s*. 1*d*. in the time of Henry VIII. This place is the most western of the main land in Wales. Lat. 51. 56 N. Lon. 5. 15 W.

DAVIE'SIA, in botany, a genus of the class decandria, order monogynia. Calyx angular, simple, five-cleft; corol papilionaceous; stigma simple, acute; legume compressed, one-seeded. One species only; a native of Australasia; a rigid shrub with simple pungent leaves.

DAVIS (John), a famous navigator in the sixteenth century, was born at Sandridge, near Dartmouth in Devonshire; and distinguished himself by making three voyages to the most northern parts of America, in order to discover a north-west passage to the East Indies: in which he discovered the straits which bear his name. He afterwards performed five voyages to the East Indies; in the last of which he was slain in a desperate fight with some Japanese, near the coast of Malacca, on the 27th of December 1605. He wrote an account of his second voyage for the discovery of the north-west passage; a voyage to the East Indies; and other tracts.

Davis's straits, an arm of the sea between Greenland and N. America, discovered by captain Davis in 1585, when he attempted to find a N.W. passage to China.

DAVIT, in a ship, that short piece of timber, with a notch at one end, wherein, by a strap, hangs the fish-block. The use of this block is to help up the fluke of the anchor, and to fasten it at the ship's bow, or loof. The davit is shiftable from one side of the ship to the other, as there is occasion. There is also a small davit in the ship's boat, that is set over her head with a shiver, in which is brought the buoy rope, wherewith to weigh the anchor.

To DAUNT. *v. a.* (*domter*, Fr.) To discourage; to fright; to intimidate (*Granville*).

DA'UNTLESS. *a.* (from *daunt.*) Fearless; not dejected (*Pope*).

DA'UNTLESSNESS. *s.* Fearlesness.

DAUPHIN, Dolphin. In astronomy. See Delphinus.

Dauphin, a title given, during the existence of royalty in France, to the eldest son and presumptive heir of the crown. For the reason of which title, see Dauphiny.

DAUPHINY, a province of France, bounded on the W. by the river Rhone, on the N. by the Rhone and Savoy, on the S. by Provence, and on the E. by the Alps. Some part of this country is fertile, producing corn, wine, olives, wood, copperas, silk, crystal, iron, and copper: but the greatest part of it is barren. It was formerly governed by its own princes; the last of whom, Dauphin Humbert, about the year 1343, made his territory over to the king of France, upon condition that the king's eldest son should enjoy it; and it was on this account that the heir to the crown of France was styled Dauphin. This province forms the present departments of Drome, Isere, and Upper Alps.

DAURAT (John), a French poet, born in 1507. He made so great a progress in his studies at Paris, that he was appointed one of the Greek professors in that university. Charles IX. made him poet-laureat, and took great pleasure in his conversation. At the age of eighty he married a young girl, who brought him a son. His poems in Greek, Latin, and French, are exceedingly numerous. He died at Paris in 1588.

DAW. In ornithology. See Corvus Monedula.

Daw (Surinam). See Corvus Surinamensis.

Daw (Black and yellow). See Oriolus Persicus.

DAWK. *s.* A hollow or incision in stuff (*Moxon*).

To **Dawk.** *v. a.* To mark with an incision.

To **DAWN.** *v. n.* 1. To grow luminous; to begin to grow light (*Pope*). 2. To glimmer obscurely (*Locke*). 3. To begin, yet faintly; to give some promises of lustre or eminence (*Pope*).

Dawn. *s.* (from the verb.) 1. The time between the first appearance of light and the sun's rise (*Dryden*). 2. Beginning; first rise (*Pope*).

DAY, a division of time arising from the appearance and disappearance of the sun.

Day is either natural or artificial.

Day (Artificial), is that which is primarily meant by the word day, and is the time of its being light, or the time while the sun is above the horizon. Though sometimes the twilight is included in the term day-light; in opposition to night or darkness, being the time from the end of twilight to the beginning of day-light.

Day (Natural), is the portion of time in which the sun performs one revolution round the earth; or rather, the time in which the earth makes a rotation on its axis. And this is either astronomical or civil.

Day (Civil), is the time allotted for day in civil purposes, and begins differently in different nations, but still including one whole rotation of the earth on its axis; beginning either at sun-rise, sun-set, noon, or midnight. 1st At sun-rising, among the ancient Babylonians, Persians, Syrians, and most other eastern nations, with the present inhabitants of the Balearic islands, the Greeks, &c. 2dly, At sun-setting, among the ancient Athenians and Jews, with the Austrians, Bohemians, Marcomanni, Silesians, modern Italians, and Chinese. 3dly, At noon, with astronomers, and the ancient Umbri and Arabians. And 4thly, at midnight, among the ancient Egyptians and Romans, with the modern English, French, Dutch, Germans, Spaniards, and Portuguese.

The day is divided into hours; and a certain number of days makes a week, a month, or a year. The old Latin names for the days in the week are still retained in the journals of parliament and of medical men: they are as follow: *dies Solis, dies Lunæ, dies Martis, dies Mercurii, dies Jovis, dies Veneris,* and *dies Saturni.*

The northern nations, however, have substituted for the Roman divinities, such of their own as most nearly resembled them in their peculiar attributes. Thus, the third day of the week, consecrated by the Romans to Mars, was named from the Scandinavian deity Tyr. In the Danish and Swedish language it is Tyrsdag, from whence our Tuesday. Tyr was an inferior deity, but presided over battles: and Tacitus renders the name Tyr by that of Mars, and makes him inferior to Odin, whom he describes under the name of Mercury. From this Odin or Wodin, we derive Wednesday, answering to dies Mercurii. Thursday is the day of the great god Thor, the most formidable of the northern deities. The goddess Freya, from whose name we derive our Friday, bears a still greater resemblance to Venus: nay, so striking is the analogy, that some authors have considered it as more than probable that the mythology of the barbarous nations of the north had a common origin with that of the Greeks and Romans.

Day (Astronomical), begins at noon, or when the sun's centre is on the meridian, and is counted twenty-four hours to the following noon.

The astronomical day, or the interval of time between two successive transits of the sun's centre over the same meridian, is called, likewise, a solar day. And the interval between two successive returns of the same fixed star to the same meridian, is called a sidereal day.

Mr. Flamstead has shewn, that one day, when the sun is in the equinoctial, is shorter than when he is in the tropics, by forty seconds; and that fourteen tropical days are longer than so many equinoctial ones, by ten minutes. This inequality of the solar days arises from a combination of two causes: the obliquity of the ecliptic, and the eccentricity of the earth's orbit; while the equation of time arises from three causes. See EQUATION OF TIME.

Mr. Euler (in Phil. Trans. vol. xlvi. p. 358), says he has some reasons, deduced from Jupiter's action on the earth, to think, that the earth's revolution upon its axis becomes continually more and more rapid. But M. Laplace (Mecanique Celeste, tom. iii.) proves both from theory, and from a computation of eclipses that took place more than 2000 years ago, that the mean length of the day has undergone no change; thus establishing the invariability of the most essential measure in all astronomical observations.

For the variety in the lengths of days and nights in different climates and seasons, see CLIMATES and SEASONS.

From DAY *to* DAY; without certainty or continuance (*Bacon*).

To-DAY. On this day (*Fenton*).

DA'YBED. *s.* (*day* and *bed.*) A bed used for idleness and luxury (*Shakspeare*).

DA'YBOOK. *s.* (from *day* and *book.*) A tradesman's journal.

DA'YBREAK. *s.* (*day* and *break.*) The dawn; the first appearance of light (*Dryden*).

DAY-FLY. In entomology. See EPHEMERA.

DAYLA'BOUR. *s.* (*day* and *labour.*) Labour by the day (*Milton*).

DAYLA'BOURER. *s.* (from *daylabour.*) One that works by the day (*Milton*).

DA'YLIGHT. *s.* (*day* and *light.*) The light of the day, as opposed to that of the moon, or a taper (*Knolles. Newton*).

DAY-LILY. In botany. See HEMEROCALLIS.

DAY-NET, a net generally used for taking such small birds as play in the air, and will stoop either to prey, gig, or the like; as larks, linnets, buntings, &c. The season of the year for using this net, is from August to November; and the best time is very early in the morning: and the milder the air, and the brighter the sun, the better will be the sport, and the longer its continuance. The place where this net should be laid, ought to be plain champaign, either on shorts tubbles, green lays, or flat meadows, near corn fields, and somewhat remote from towns and villages: the net must lie close to the ground, that the birds creep not out and make their escape.

This net is made of fine packthread, with a small mesh, not exceeding half an inch square: it must be three fathoms long, and one broad; its shape is like the crow-net, and it must be verged about after the same manner, with a small but strong cord, and the two ends extended upon two small, long poles, adapted to the breadth of the net, with four stakes, tail-strings, and drawing-lines.

The net is double, each side being exactly alike; and laid opposite to each other, so even and close, that when they are drawn and pulled over, they must meet and touch.

Fix the net down with strong stakes, very stiff on their lines, so that you may with a nimble twitch cast them backwards and forwards at pleasure; then fasten your drawing-cords, or hard-lines (of which there must be a dozen at least, each two yards long) to the upper end of the foremost staves: and so extend them of such a straightness, that with a little strength they may raise up the nets, and cast them over.

Your net being thus laid, place your gigs, or playing wantons, about twenty or thirty paces beyond, and as much on this side your nets: the gigs must be fastened to the tops of long poles, and turned into the wind, so as to play and make a noise in it. These gigs are a sort of toys made of long goose-feathers, like shuttle-cocks, with little small tunnels of wood, running in broad and flat swan-quills, made round, like a small hoop; whence with longer strings fastened to the pole, they will, with any small wind or air, so move, that birds will come, in great flocks, to play about them.

When you have placed your gigs, next place your decoy; which is a small stake of wood, to prick down in the earth, having in it a mortice-hole, in which a small, long, and slender piece of wood, about two feet long, is fastened, so that it may move up and down at pleasure: and fasten to this longer stick, a small line, which running through a hole in the stick, and so coming up to the place where you are to sit, you may, by drawing the line up and down with your right hand, raise up the longer stick from the ground, as you see occasion.

Fasten a live lark, or some similar bird, to this longer stick, with which the line making it to stir up and down by your pulling, will entice the birds to come to your net.

There is another enticement, to attract these birds, called a looking-glass; which is a round stake of wood, as big as a man's arm, made very sharp at the end, to be thrust into the ground. Artists make it very hollow in the upper part, about five fingers deep; into which hollow they place a three-square piece of wood, about a foot long, and each two inches broad, lying upon the top of the stake, and going with a foot into the hollowness; which foot must have a great knob at the top, and another at the bottom, with a deep slenderness between, to which slenderness you are to fasten a small packthread, which running through a hole in the side of the stake, must come up to the place where you sit. The three-square piece of wood which lies on the top of the stake, must be of such a true poise and evenness, and the foot in the socket so smooth and globular, that it may whirl and turn round upon the least touch, winding the packthread so many times about it, which being suddenly drawn and as suddenly relinquished, will keep the engine in a constant rotation: then fasten with glue, upon the uppermost flat squares of the three-square piece, about twenty small pieces of looking-glass, and paint all the square wood between them of a light and lively red; which in the continual motion will give such a reflection, that the birds will play about to admiration till they are taken.

Both this and the other decoy are to be

placed in the midst between the two nets, at about two or three feet distance from each other; so that in the falling of the nets, the cords may not touch or annoy them: neither must they stand one before or after another, the glass being kept in a continual motion, and the bird very often fluttering. Having placed your net in this manner, as also your gigs and lures, go to the further end of your long drawing-lines and enticing-lines, and having fixed yourself, lay the main drawing-line across your thigh, and with your left hand pull the decoy-line to shew the birds; and when you perceive them play near and about your nets and lures, pull the net over with both hands with a quick, but not too hasty, motion; otherwise your sport will be spoiled.

Remember to lay behind you, where you sit, all the spare instruments and implements to be used; as stakes, poles, line, packthread, knitting-pin, and needle, your decoy-bag, a mallet to knock in the stakes upon occasion: and, lastly, let the first half dozen of birds you take be kept alive for lures, for you must not be unprovided with these upon any account.

In Plate XCII. fig. 1. A shews the bodies of the main net, and how they ought to be laid. B the tail, or hinder lines, staked to the ground. C the fore lines, staked also to the ground. D the knitting-needle. E the bird-lure. F the looking-glass lure. G the line which draws the bird-lure. H the line that draws the glass-lure. I the drawing double lines of the net which pulls them over. K the stakes which stake down the four nether points of the net, and the two tail-lines. L the stakes that stake down the fore-lines. M the single line, with the wooden button to pull the net over with. N the stake that staketh down the single line, and where the sportsman should sit. O the wooden mallet. P the hatchet: and Q the gig.

DAYS IN BANK, are days set down by statute or order of the court, when writs shall be returned, or when the party shall appear on the writ served. They say also, if a person is dismissed without day, he is finally discharged.

DAYS OF GRACE, are those granted by the court at the prayer of defendant or plaintiff. In commerce, days of grace, are the three days allowed for the payment of a bill of exchange, &c. after the same has become due. It is the custom to give ten days in France and Dantzic; eight at Naples; six at Venice, &c.

DAYS-MAN, in the common translation of the Bible, an arbitrator, or one who decides between disputing parties. The word is now used in this sense in some parts of the north of England.

DAYS INTERCALARY. See BISSEXTILE and INTERCALARY.

DA'YSPRING. *s.* (*day* and *spring.*) The rise of the day; the dawn (*Milton*).

DA'YSTAR. *s.* (*day* and *star.*) The morning star (*Ben Jonson*).

DAY'SWORK, among seamen, the account of a ship's course during twenty-four hours.

DA'YTIME. *s.* (*day* and *time.*) The time in which there is light: opposed to night (*Bacon*).

DA'YWORK. *s.* (*day* and *work.*) Work imposed by the day; daylabour (*Fairfax*).

To DAZE. *v. a.* (ꝺpœꝛ, Saxon.) To overpower with light (*Fairfax. Dryden*).

DA'ZIED. *a.* Besprinkled with daisies (*Shakspeare*).

To DA'ZZLE. *v. a.* To overpower with light (*Davies*).

To DA'ZZLE. *v. n.* To be overpowered with light; to lose the power of sight (*Bacon*).

DEACON, DIACONUS, an officer in the Christian church. The word is formed from the Latin *diaconus*: of the Greek διακονος, minister, servant.

The institution of deacons may be traced to the Acts of the Apostles, ch. vi. v. 1—6: whence it appears that their business is to take care of the poor, and serve tables; that is, to see that the table of the Lord, the table of the poor, and the table of the pastor or minister, be supplied. Deacons should be chaste, sincere, and blameless, 1 Tim. iii. 8—12. Grotius apprehends that the order of deacons in the Christian church corresponded to that of eleemosynaries in the Jewish synagogue. Their office was, to serve in the agapæ, and to distribute the bread and wine to the communicants, and dispense the alms. Tertullian informs us, that the deacons preached, and, in the absence of the bishop and presbyters, conferred the sacrament of baptism. De Bapt. p. 602.

At Rome, under pope Sylvester, they had only one deacon; then seven were appointed; then fourteen; and, at last, eighteen; who were called cardinal deacons, to distinguish them from those of other churches.

Their office was to take care of the temporalities of the church, to look to the rents and charities, and provide for the necessities of the ecclesiastics, and even of the pope. The collecting of the rents, alms, &c. belonged to the subdeacons; the deacons were the depositaries and distributers. Having thus the management of the revenues of the church in their hands, their authority grew apace, as the riches of the church increased. Those of Rome, as being ministers of the first church, preceded all others, and even at length took place of the priests themselves. Doubtless, it was the avarice of the priests that made them give place to the deacons, who had the disposal of the money.

The office of a deacon, in the church of England, according to the form of ordination, is to baptize, preach, and assist in the administration of the Lord's supper; and, in short, to perform all the other offices in the liturgy, which a priest can do, except that of consecrating the elements of the Lord's supper, and pronouncing the absolution. No person can be ordained a deacon under the age of twenty-three years, unless by a faculty or dispensation obtained from the archbishop of Canterbury: and in order to this, he must be provided with a title to a cure, or be a fellow or chaplain in some college in Cambridge or Oxford, or a master of arts of five years standing, living at his own charge in either of the universities, or be admitted by the bishop who ordains him to some benefice or curacy then void. Otherwise the ordaining bishop shall maintain him, till he is preferred to some ecclesiastical living. And by stat. 13 and 14 Car. II. c. 4, no person is capable of being admitted to any benefice or ecclesiastical promotion, till he be ordained a priest; nor is a deacon capable of a donative, but is only allowed to use his orders as a chaplain to some family, a curate to some priest, or a lecturer without a title.

In the church of Scotland, the deacon's office only requires him to take care of the poor.

DEACONESS, a female deacon; an order of women who had their distinct offices and services in the primitive church. This office appears as ancient as the apostolical age; for St. Paul calls Phebe a servant of the church of Cenchrea. The original word is διακονος, answerable to the Latin word *ministra*. Tertullian calls them *viduæ*, widows, because they were commonly chosen out of the widows of the church; and, for the same reason, Epiphanius, and the council of Laodicea, calls them πρεσβυτιδας, elderly women, because none but such were ordinarily taken into this office. For, indeed, by some ancient laws, these four qualifications were required in every one that was to be admitted into this order. 1. That she should be a widow. 2. That she should be a widow that had borne children. 3. A widow that was but once married. 4. One of a considerable age, 50 or 60 years old: though all these rules admitted of exceptions.

One part of their office was to assist the minister at the baptizing of women, to undress them for immersion, and to dress them again, that the whole ceremony might be performed with all the decency becoming so sacred a rite. Another part of their office was to be private catechists to the women-catechumens who were preparing for baptism. They were likewise to attend the women that were sick and in distress; to minister to martyrs and confessors in prison; to attend the women's gate in the church; and lastly, to assign all women their places in the church, regulate their behaviour, and preside over the rest of the widows; whence in some canons they are styled προκαθημεναι, governesses. This order, which since the tenth or twelfth century has been wholly laid aside, was not abolished every where at once, but continued in the Greek church longer than in the Latin, and in some of the Latin churches longer than in others.

DE'ACONRY. De'aconship. *s.* The office or dignity of a deacon.

DEAD. *s.* (ꝺeaꝺ, Saxon.) 1. Deprived of life; exanimated (*Hale*). 2. Without life; inanimate (*Pope*). 3. Imitating death: senseless; motionless (*Psalms*). 4. Unactive; motionless (*Lee*). 5. Empty; vacant (*Dryden*). 6. Useless; unprofitable (*Addison*). 7. Dull; gloomy; unemployed (*Knolles*). 8. Still; obscure (*Hayward*). 9. Having no resemblance of life (*Dryden*). 10. Obtuse; dull; not sprightly (*Boyle*). 11. Dull; frigid; not animated (*Addison*). 12. Tasteless; vapid; spiritless. 13. Uninhabited (*Arbuthnot*). 14. (In theology.) The state of spiritual death, lying under the power of sin.

The Dead. *s.* Dead men (*Smith*).

Dead. *s.* Time in which there is remarkable stillness or gloom: as at midwinter and midnight (*South. Dryden*).

To Dead. *v. n.* (from the noun.) To lose force, of whatever kind (*Bacon*).

To Dead. *To* De'aden. *v. a.* 1. To deprive of any kind of force or sensation (*Bacon*). 2. To make vapid, or spiritless (*Bacon*).

DEAD-DOING. *particip. a.* (*dead* and *do.*) Destructive; killing; mischievous (*Hudibras*).

DEAD-EYES, in naval affairs, certain blocks with three holes in them, whereby to draw tight the shrouds and stays of a ship.

DEAD-LIFT. *s.* (*dead* and *lift.*) Hopeless exigence (*Hudibras*).

DEAD-LIGHT, amongst seamen, a sort of strong wooden posts, made to fit the cabin-windows: they are always fixed in on any expectation of a storm, and the glass windows taken out, which might otherwise be shattered to pieces by the sea, and let great quantities of water pour into the ship.

DEAD-NETTLE. In botany. See Lamium.

DEAD-RECKONING, in navigation, the judgment or estimation which is made of the place where a ship is, without any observation of the heavenly bodies; and is performed by keeping an account of her way by the log, in knowing the course they have steered by the compass, and by rectifying all the allowances for drift, lee-way, &c. according to the ship's known trim. This reckoning, however, is always to be corrected as often as any good observation can be obtained.

DEAD SEA, or Lake Asphaltites. (See Asphaltites). A large lake, or inland sea of Palestine, into which the river Jordan runs. This latter contains neither animal nor vegetable life, no verdure on its banks, or fish in its waters. Mr. Maundrel, in his Journey from Aleppo to Jerusalem, informs us, that the Dead sea is enclosed on the east and west with exceedingly high mountains; on the north it is bounded by the plain of Jericho, on which side it receives the waters of Jordan. On the south it is open, and extends beyond the reach of the eye. It is said to be twenty-four leagues long, and six or seven broad. "On the shore of the lake, we found (says he), a black sort of pebble, which being held in the flame of a candle, soon burns, and yields a smoke of an intolerable stench. It has this property, that it loses only of its weight, and not of its apparent bulk, by burning." The hills bordering upon the lake are said to abound with this sort of sulphureous stones. As for the bitumen, there was none at the place where Mr. Maundrel was; but it is gathered near the mountains on both sides in great plenty. He had several lumps of it brought to him at Jerusalem. It exactly resembled pitch, and could scarcely be distinguished from it, but by its sulphureousness of smell and taste. Mr. Wells, in his Scripture Geography, assigns several forcible reasons for the belief, that the present appearances about the Dead sea are really caused by the divine judgment on Sodom and the cities of the plain, vol. i. p. 146.

Mr. Gordon of Clunie, who has recently travelled in Palestine, presented a phial of the Dead sea water to sir Joseph Banks, at whose request it was carefully analysed by Dr. Alexander Marcet. One of the most obvious peculiarities is, the great specific gravity of this water, which Dr. Marcet found to be 1·211. The following is given as the most accurate result of the analysis. On summing up the contents of 150 grains of the water, they appeared to be

	Salts.	*Acids.*
Muriat of lime . .	5·88 grs.	2·89 grs.
Muriat of magnesia .	15·87	8·61
Muriat of soda . .	15·54	7·15
Selenite	0·03	
	36·87	18·65

And consequently the proportions of these salts in 100 grains of the water would be:

Muriat of lime . . .	3·920 grs.
Muriat of magnesia . .	10·246
Muriat of soda . . .	10·360
Sulphat of lime . . .	0·054
	24·580

Hence it appears, that the Dead sea water now contains about one-fourth of its weight of salts, supposed in a state of perfect desiccation; or, if they be desiccated at the temperature of 180° on Fahrenheit's scale, they will amount to forty-one per cent. of the water! (Phil. Trans. for 1807). This appears to us to furnish the strongest possible confirmation of the Scripture account of the origin of the Dead sea.

DE'ADLY. *a.* (from *dead.*) 1. Destructive; mortal; murderous (*Shakspeare*). 2. Mortal: implacable (*Knolles*).

De'adly. *ad.* 1. In a manner resembling the dead (*Dryden*). 2. Mortally (*Ezekiel*). 3. Implacably; irreconcilably; destructively.

Deadly carrot. See Thapsia.

Deadly nightshade. See Atropa.

DE'ADNESS. *s.* (from *dead.*) 1. Frigidity; want of warmth; want of ardour; want of affection (*Rogers*). 2. Weakness of the vital powers; languor; faintness; inactivity of the spirits (*Lee*). 3. Vapidness of liquors; loss of spirit (*Mortimer*).

DEAF. *a.* (*doof*, Dutch.) 1. Wanting the sense of hearing (*Holder*). 2. Deprived of the power of hearing (*Dryden*). 3. Obscurely heard (*Dryden*).

To **Deaf.** *To* **De'afen.** *v. a.* To deprive of the power of hearing (*Dryden*).

DE'AFLY. *ad.* (from *deaf.*) 1. Without sense of sounds. 2. Obscurely to the ear.

DE'AFNESS. *s.* (from *deaf.*) 1. Want of the power of hearing; want of sense of sounds (*Holder*). 2. Unwillingness to hear (*King Charles*).

Deafness, the state of a person who wants the sense of hearing; or, the disease of the ear, which prevents its due reception of sounds. Deafness generally arises either from an obstruction or a compression of the auditory nerve; or from some collection of matter in the cavities of the inner ear; or from the auditory passage being stopped up by some hardened excrement; or, lastly, from some excrescence, a swelling of the glands, or some foreign body introduced within it. Those born deaf are also dumb; not being able to learn any language, at least in the common way. However, as the eyes in some measure serve them for ears, they may understand what is said by the motion of the lips, tongue, &c. of the speaker; and even accustom themselves to move their own, as they see other people do, and by this means learn to speak. Thus it was that Dr. Wallis taught two young gentlemen, born deaf, to know what was said to them, and to return pertinent answers. Digby gives us another instance of the same, within his own knowledge; and there was a Swiss physician lately living in Amsterdam, one John Conrad Amman, who effected the same, in several children born deaf, with surprising success.

In the Philosophical Transactions, No. 312, we have an account by Mr. Waller, R. S. secretary, of a man and his sister, each about fifty years old, born in the same town with Mr. Waller, who had neither of them the least sense of hearing; yet both of them knew, by the motion of the lips only, whatever was said to them, and would answer pertinently to the question proposed. It seems they could both hear and speak when children, but lost their sense afterwards: whence they retained their speech, which, though uncouth, was yet intelligible. Such another instance is related by bishop Burnet of a young woman. "At two years old, they perceived she had lost her hearing; and ever since, though she hears great noises, yet hears nothing of what is said to her: but by observing the motions of the mouth and lips of others, she acquired so many words, that out of these she has formed a sort of jargon, in which she can hold conversation whole days with those that can speak her language. She knows nothing that is said to her, unless she see the motion of their mouths that speak to her, so that in the night they are obliged to light candles to speak to her. One thing will appear the strangest part of the whole narration: she has a sister, with whom she has practised her language more than with any body else; and in the night, by laying her hand on her sister's mouth, she can perceive by that what she says, and so can discourse with her in the dark."

It is observable, that deaf persons, and several others thick of hearing, hear better and more easily if a loud noise be raised at the time when you speak to them; which is owing, no doubt, to the greater tension of the ear-drum on that occasion. Dr. Wallis mentions a deaf woman, who, if a drum were beat in the room, could hear any thing very clearly; so that her husband hired a drummer for a servant, that by this means he might hold conversation with his wife. The same author mentions another, who, living near a steeple, could always hear very well if there was a ringing of three or four bells, but never else. See EAR TRUMPET.

The abbé de l'Epée, and M. Sicard, have been very successful in educating the deaf and dumb. De l'Epée's method was translated into English, and published by Cadell and Davies, in 1801: we extract the commencement of the process of instruction, as comprehending the leading principles of the scheme:

"It is not by the mere pronunciation of words, in any language, that we are taught their signification: the words *door*, *window*, &c. in our own, might have been repeated to us hundreds of times in vain: we should never have attached an idea to them, had not the objects designated by these names been shewn to us at the same time. A sign of the hand or of the eye has been the sole mean by which we learned to unite the idea of these objects with the sounds that struck our ear. Whenever we heard these sounds, the same ideas arose in our minds, because we recollected the signs made to us when they were pronounced.

"Exactly similar must be our measures with the deaf and dumb. Their tuition commences with teaching them a manual alphabet, such as boys at school make use of to hold conversation at one end of a form with their companions at the other. The various figures of these letters strike forcibly the eyes of deaf and dumb persons, who no more confound them, than we confound the various sounds that strike our ears.

"We next write (I say *we*, because in the operations with my deaf and dumb pupils, I frequently have assistance) in large characters with a white crayon, upon a black table, these two words, *the door*, and we shew them the door. They immediately apply their manual alphabet five or six times to each of the letters composing the word *door* (they spell it with their fingers) and impress on their memory the number of letters and arrangement of them; this done, they efface the word, and taking the crayon themselves, write it down in characters, no matter whether well or ill formed; afterwards they will write it, as often as you shew them the same object.

"It will be the same with respect to every thing else pointed out to them, the name being previously written down; which being first on the table, in large characters, may afterwards be inscribed in characters of ordinary size, upon different cards; and these being given to them, they amuse themselves in examining one another's proficiency, and ridicule those that blunder. Experience has manifested that a deaf and dumb person possessing any mental powers will acquire by this method upwards of eighty words in less than three days.

"Take some cards having suitable inscriptions, and deliver them one by one to your pupil; he will carry his hand successively to every part of his body conformably to the name on the card delivered to him. Mix and shuffle the cards as you please; he will make no mistake; or if you choose to write down any of these names on the table, you will see him, in like manner, distinguish with his finger every object whose name is so offered him; and thus clearly prove that he comprehends the meaning of every one.

"By this process the pupil will obtain, in very few days, a knowledge of all the words which express the different parts of our frame, from head to foot, as well as of those that express the various objects which surround us, on being properly pointed out to him as you write their names down on the table, or on cards put into his hands.

"We are not, however, even in this early stage, to confine ourselves to this single species of instruction, amusing as it is to our pupils. The very first or second day we guide their hands to make them write down, or we write down for them ourselves, the present tense of the indicative of the verb *to carry*.

"Several deaf and dumb pupils being round a table, I place my new scholars on my right hand. I put the forefinger of my left hand on the word *I*, and we explain it by signs in this manner: showing myself with the forefinger of my right, I give two or three gentle taps on my breast. I then lay my left forefinger on the word *carry*, and taking up a large quarto volume, I carry it under my arm, in the skirts of my gown *, on my shoulder, on my head, and on my back, walking all the while with the mien of a person bearing a load. None of these motions escape his observation.

"I return to the table; and in order to explain the second person, I lay my left forefinger on the word *thou*, and carrying my right to my pupil's breast, I give him a few gentle taps, making him notice that I look at him, and that he is likewise to look at me. I next lay my finger on the word *carriest*, the second person, and having delivered him the quarto volume, I make signs for him to perform what he has just seen me perform: he laughs, takes the volume, and executes his commission extremely well."

This method is adapted to the conception of the pupil, in his progress through the intricacies of grammar. The following description of the means of initiating him in a knowledge of the tenses of verbs will convey a sufficient idea of the plan to general readers:

"The pupil, though deaf and dumb, had, like us, an idea of the past, the present, and the future, before he was placed under our tuition, and was at no loss for signs to manifest the difference.

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* "In France, the priests used to go in clerical habits as their ordinary dress."

"*Did he mean to express a present action?* He made a sign prompted by nature, which we all make in the same case without being conscious of it, and which consists in appealing to the eyes of the spectators to witness the presence of our operation; but if the action did not take place in his sight, he laid his two hands flat upon the table, beating upon it gently, as we are all apt to do on similar occasions: and these are the signs he learns again in our lessons, by which to indicate the present of a verb

"Did he design to signify that an action is past? He tossed his hand carelessly, two or three times over his shoulder: these signs we adopt to characterize the past tenses of a verb.

"And lastly, when it was his intent to announce a future action, he projected his right hand: here again is a sign we give him to represent the future of a verb.

"It is now time to call in art to the assistance of nature.

"Having previously taught him to write out the names of the seven days of the week, one directly under the other, we desire him to set them down in that order, and we then put on each side of his writing what follows before and after the same words under different heads.

Present.

To-day—Sunday—I arrange nothing.

Imperfect.

Yesterday—Monday—I was arranging my books.

Perfect.

Day before yesterday—Tuesday—I arranged my chamber.

Past Perfect.

Three days ago—Wednesday—I had arranged my closet.

Future.

To-morrow—Thursday—I shall arrange my papers.

Future.

Day after to-morrow—Friday—I shall arrange my drawers.

Future.

Three days hence—Saturday—I shall arrange my cupboards.

"*Yesterday, day before yesterday, three days ago*, are explained by the number of times we have slept since the day of which we speak.

"*To-morrow, day after to-morrow, three days hence*, are explained by the number of times we are to sleep till the day in question arrive.

"We next teach our pupil to lay a restriction upon his motions. To express a thing past, he used to throw his arm backwards and forwards towards his shoulder, without rule: we tell him, he must throw it only once for the imperfect, twice for the perfect, and three times for the past perfect; which in truth is analogous to what is signified, the past perfect announcing an action longer past than the perfect; and the latter being in the same predicament with regard to the imperfect."

An asylum for the support and education of the poor was instituted in 1792, under the patronage of the marquis of Buckingham. A spacious building for the reception of the pupils is just erected at the bottom of Kent street, on the road to Deptford. We sincerely wish an establishment instituted with so laudable a purpose may meet with all the encouragement it deserves: and when it is known that the number of deaf and dumb in this country amounts to several hundreds we trust the liberality of the British public will need no other stimulus.

DEAL. *s.* (*deel*, Dutch.) 1. Part. 2. Quantity; degree of more or less (*Ben Jonson*). 3. (From the verb.) The art or practice of dealing cards (*Swift*). 4. (*deyl*, Dutch.) Fir-wood, or the wood of pines (*Boyle*).

DEAL, a seaport in Kent, with a market on Thursdays. It is seated on the straits of Dover, and is a member of the cinque port of Sandwich, governed by a mayor. It contains 917 houses, and 5420 inhabitants. Lat. 51. 13 N. Lon. 1 29 E.

To DEAL. *v. a.* (*deelen*, Dutch.) 1. To distribute; to dispose to different persons (*Tickel*). 2. To scatter; to throw about (*Dryden*). 3. To give gradually, to one after another (*Gay*).

To DEAL. *v. n.* 1. To traffick; to trade (*Decay of Piety*). 2. To act between two persons; to intervene (*Bacon*). 3. To behave well or ill in any transaction (*Tillotson*). 4. To act in any manner (*Shakspeare*). 5. *To* DEAL *by*. To treat well or ill (*Locke*). 6. *To* DEAL *in*. To have to do with; to be engaged in; to practise (*Atterbury*). 7. *To* DEAL *with*. To treat in any manner; to use well or ill (*South. Tillotson*). 8. *To* DEAL *with*. To contend with (*Sidney*).

To DEA'LBATE. *v. a.* (*dealbo*, Lat.) To whiten; to bleach.

DEALBATION. *s.* (*dealbatio*, Lat.) The act of bleaching or whitening (*Brown*).

DE'ALER. *s.* (from *deal*.) 1. One that has to do with any thing (*Swift*). 2. A trader or trafficker (*Swift*). 3. A person who deals the cards.

DE'ALING. *s.* (from *deal*.) 1. Practice; action (*Raleigh*). 2. Intercourse (*Addison*). 3. Measure of treatment (*Hammond*). 4. Traffick; business (*Swift*).

DEAMBULATION. *s.* (*deambulatio*, Lat.) The act of walking abroad.

DEA'MBULATORY. *a.* (*deambulo*, Lat.) Relating to the practice of walking abroad.

DEAN, a prime dignitary in most cathedral and collegiate churches; being usually the president of the chapter. He is called *dean*, *decanus*, of the Greek δέκα, ten, as being supposed to preside over ten canons or prebendaries, at least.

Canonists distinguish between deans of cathedral, and those of collegiate churches. The first, with their chapter, are regularly subject to the jurisdiction of the bishop. As to deans of collegiate churches, they have usually the comtentious jurisdiction in themselves, that is, they exercise jurisdiction over their canons in all civil or criminal matters; though sometimes this belongs to them in common with the chapter.

In England, as there are two foundations of cathedral and collegiate churches, the old and the new (the latter being those founded by Henry the Eighth on the suppression of the abbots and priors, when their convents were turned into dean and chapter); so there are two ways of creating the deans. Those of the old foundation, as the deans of St. Paul's, York, &c. are raised to their dignity much like a bishop; the prince first sending out his conge d'elire to the chapter; the chapter then choosing, the king yielding his royal assent, and the bishop confirming him, and giving his mandate to instal him. Those of the new foundation, as the deans of Canterbury, Durham, Ely, Norwich, Winchester, &c. are donative, and are installed by a shorter course; only by the king's letters patent, without either election or confirmation. There are some cathedral churches, which never had a dean; as that of St. David's and Landaff, where the bishop is the head of the chapter, and in his absence the archdeacon.

Constantine, we are told, erected an office of nine hundred and fifty persons at Constantinople, taken out of divers trades and professions, whom he exempted from all impositions, and bestowed them on the cathedral church, to render the offices of burial gratis to the defunct, particularly to the poor. These he called *decani*, and *lecticarii*, probably because they were divided by tens; each whereof had a bier, or litter, to carry the bodies in. It is supposed to be these, who, under Constantius, began to be called *copiatæ*; i. e. clerks destined for labour; for they are usually ranked among the clerks, and even before the chantors. By a law of the year 357, it appears, that there were some of these *copiatæ* at Rome.

There are also deans without a chapter, as the dean of Battle in Sussex, dean of the arches, &c. and deans without a jurisdiction, as the dean of the chapel royal. In this sense the word is applied to the chief of certain peculiar churches or chapels.

Dean and chapter, are the bishop's council to assist him in the affairs of religion, and to assent to every grant which the bishop shall make to bind his successors. As a deanery is a spiritual dignity, a man cannot be a dean and prebendary of the same church.

Dean (Rural), or **Dean** (Urban), was formerly an ecclesiastical person, who had a district of ten churches, or parishes, either in the country or city, within which he exercised jurisdiction.

Dean, a town of Gloucestershire, with a market on Mondays. Lat. 51. 50 N. Lon. 2. 31 W.

Dean forest, in Gloucestershire, takes its name from the above town. It includes that part of the county which lies between the Severn and the shires of Monmouth and Hereford. It contains four market-towns, and twenty-three parishes, and is in general very fertile.

DE'ANERY. *s.* (from *dean.*) 1. The office of a dean (*Clarendon*). 2. The revenue of a dean (*Swift*). 3. The house of a dean (*Shakspeare*).

DE'ANSHIP. *s.* (from *dean.*) The office and rank of a dean.

DEAR. *a.* (ꝺeoꞃ, Saxon.) 1. Beloved; favourite; darling (*Addison*). 2. Valuable; of a high price; costly (*Pope*). 3. Scarce; not plentiful: as, *a* dear *year.* 4. Sad; hateful; grievous (*Shakspeare*).

Dear. *s.* A word of endearment (*Dryden*).

DE'ARBOUGHT. *a.* (*dear* and *bought.*) Purchased at a high price (*Roscommon*).

DE'ARLING. *s.* (now written *darling.*) Favourite (*Spenser*).

DE'ARLY. *ad.* (from *dear.*) 1. With great fondness (*Wotton*). 2. At a high price (*Bacon*).

To **DEARN.** *v. a.* (ꝺẏꞃnan, Saxon.) To mend clothes.

DE'ARNESS. *s.* (from *dear.*) 1. Fondness; kindness; love (*South*). 2. Scarcity; high price (*Swift*).

DE'ARNLY. *ad.* (ꝺeoꞃn, Saxon.) Secretly; privately; unseen: obsolete (*Spenser*).

DEARTH. *s.* (from *dear.*) 1. Scarcity which makes food dear (*Bacon*). 2. Want; need; famine (*Shakspeare*). 3. Barrenness; sterility (*Dryden*).

To **DEARTI'CULATE.** *v. a.* (*de* and *articulus*, Lat.) To disjoint; to dismember.

DEARTICULATION. See Diarthrosis.

DEATH. *s.* (ꝺeað, Saxon.) 1. The extinction of life (*Hebrews*). 2. Mortality; destruction (*Shakspeare*). 3. The state of the dead (*Shakspeare*). 4. The manner of dying (*Ezekiel*). 5. The image of mortality represented by a skeleton (*Shakspeare*). 6. Murder; the act of destroying life unlawfully (*Bacon*). 7. Cause of death (*Kings*). 8. Destroyer (*Bre.*). 9. (In poetry.) The instrument of death (*Dryden*). 10. (In theology.) Damnation; eternal torments (*Church Catechism*).

Death (Symptoms of). The following are the most certain signs of death, if taken collectively. 1. Cessation of the pulse. 2. Total suppression of breathing. 3. Loss of animal heat. 4. Rigidity of the body and inflexibility of the limbs. 5. Relaxation of the lower jaw. 6. Inability of the eyeballs to return to their sockets, when pressed by the finger. 7. Dimness, faintness, and sinking of the cornea, or the uppermost horny coat of the eye. 8. Foam in the cavity of the mouth. 9. Blue spots of various sizes, and on different parts of the body. 10. A cadaverous smell. 11. Insensibility to all external stimulants. All these symptoms, however, says Dr. Willich, if individually considered, are far from being conclusive: they then only afford a certain criterion of death, when most, or all of them, concur at the same time; especially, if the sixth, seventh, and tenth of the signs be strongly marked. (*Dom. Encyclo.*).

DEATH (Apparent), is that state in which life is suspended, either because the body is not susceptible of external stimuli, or the interior organs are in a state similar to that of palsy.

Dr. Struve, in his Practical Essay on the Art of recoveiing Suspended Animation, lately translated from the German, 12mo. London, 1801, exhibits the following view of all the

Symptoms of Life.—A slight degree of warmth in the region of the heart, accompanied with contractions and dilatations; a vibrating motion of the whole body, especially after being sprinkled with cold water; and a convulsive tension of some muscles.

Doubtful Signs.—Rigidity of the limbs, gradual smoothness of the skin, warmth and redness in particular parts of the body, hiccough, contraction and hissing of the nostrils, a tremulous motion of the whole body, mucus issuing from the nose during the artificial inflation of the lungs, a slight convulsive motion of the mouth, and a firm compression of the teeth.

More certain Signs.—Gentle throbbing of the heart; pulsation of the temporal arteries; a slight convulsive motion of the inner corner of the eye; vibration of the eye-ball; and almost imperceptible convulsions of the muscles surrounding the neck.

Distinct Signs of Life.—A gentle motion of the jaw; gradual redness of the lips and cheeks; contraction of the different muscles in the face; convulsive motions of the toes; sneezing; tremor of the whole body; vomiting; respiration interrupted by coughing and groaning.

DE'ATHBED. *s.* (*death* and *bed.*) The bed to which a man is confined by mortal sickness (*South*).

DE'ATHFUL. *a.* (*death* and *full.*) Full of slaughter; destructive; murderous (*Raleigh*).

DE'ATHLESS. *a.* (from *death.*) Immortal; never-dying; everlasting (*Boyle*).

DE'ATHLIKE. *a.* (*death* and *like.*) Resembling death; still; placid; calm (*Crashaw*).

DE'ATH'S-DOOR. *s.* (*death* and *door.*) A near approach to death (*Taylor*).

DE'ATHSMAN. *s.* (*death* and *man.*) Executioner; hangman; headsman (*Shakspeare*).

DEATH-WATCH, in zoology, the name of the pediculus of old wood, a species of the termes. See TERMES.

Sir Thomas Brown long ago observed, that "he that could extinguish the terrifying apprehensions of the death-watch, might prevent the passions of the heart, and many cold sweats in grandmothers and nurses." With the feelings of these persons a well known satirist sports in the following lines:

——"A wood-warm
That lies in old wood like a hare in her
form;
With teeth or with claws, it will bite or
will scratch,
And chambermaids christen this worm a
death-watch:
Because like a watch it always cries click;
Then woe be to those in the house who are
sick,
For sure as a gun they will give up the
ghost,
If the maggot cries click, when it scratches
the post."

To DEA'URATE. *v. a.* (*deauro*, Lat.) To gild, or cover with gold.

DEAURATION. *s.* (from *deaurate.*) The act of gilding.

DEBACCHA'TION. *s.* (*debacchatio*, Lat.) A raging; a madness.

To DEBA'R. *v. a.* (from *bar.*) To exclude; to preclude; to hinder (*Raleigh*).

To DEBA'RB. *v. a.* (from *de* and *barba*, Latin.) To deprive of his beard.

To DEBA'RK. *v. a.* (*debarquer*, Fr.) To disembark; to leave the ship.

To DEBA'SE. *v. a.* (from *base.*) 1. To reduce from a higher to a lower state (*Locke*). 2. To make mean; to degrade (*Hooker*). 3. To sink; to vitiate with meanness (*Addison*). 4. To adulterate; to lessen in value by base admixtures (*Hale*).

DEBA'SEMENT. *s.* (from *debase.*) The act of debasing; degradation (*Government of the Tongue*).

DEBA'SER. *s.* (from *debase.*) He that debases; he that adulterates; he that sinks the value of things.

DEBA'TABLE. *a.* (from *debate.*) Disputable; subject to controversy (*Hayward*).

DEBA'TE. *s.* (*debat*, French.) 1. A personal dispute; a controversy (*Locke*). 2. A quarrel; a contest (*Dryden*).

To DEBA'TE. *v. a.* (*debatre*, French.) To controvert; to dispute; to contest (*Clarendon*).

To DEBA'TE. *v. n.* 1. To deliberate (*Shakspeare*). 2. To dispute (*Tatler*).

DEBA'TEFUL. *a.* (from *debate.*) 1. Quarrelsome; contentious. 2. Contested; occasioning quarrels.

DEBA'TEMENT. *s.* (from *debate.*) Controversy; deliberation (*Shakspeare*).

DEBA'TER. *s.* (from *debate.*) A disputant; a controvertist.

To DEBA'UCH. *v. a.* (*desbaucher*, Fr.) 1. To corrupt; to vitiate (*Dryden*). 2. To corrupt with lewdness (*Shakspeare*). 3. To corrupt by intemperance (*Tillotson*).

DEBA'UCH. *s.* 1. A fit of intemperance (*Calamy*). 2. Luxury; excess; lewdness (*Dryden*).

DEBAUCHE'E. *s.* (from *desbauché*, Fr.) A lecher; a drunkard (*South*).

DEBA'UCHER. *s.* (from *debauch.*) One who seduces others to intemperance or lewdness.

DEBA'UCHERY. *s.* (from *debauch.*) The practice of excess; lewdness (*Spratt*).

DEBA'UCHMENT. *s.* (from *debauch.*)

The act of debauching or vitiating; corruption (*Taylor*).

To DEBE'L. *To* Debe'llate. *v. a.* (*debello*, Latin.) To conquer; to overcome in war: not in use (*Bacon*).

DEBELLA'TION. *s.* (from *debellatio*, Lat.) The act of conquering in war.

DEBEN, a river in Suffolk, which rises near Debenham, and flows to Woodbridge, where it expands into a long narrow arm of the German ocean, a little to the N. of Harwich.

DE BENE ESSE, a Latin phrase used in our law in a doubtful meaning, as to take or do a thing *de bene esse*, is to allow it at present to be well done; but when it comes to be more fully examined, then to stand or fall according to the merit of the thing.

DEBENHAM, a town in Suffolk, with a market on Friday, seated near the head of the Deben, on the side of a hill, twenty-four miles E. of Bury St. Edmunds, and eighty-four N.E. of London. Lat. 52. 22 N. Lon. 1. 17 E.

DEBENTURE, in commerce, a term used at the custom-house, when the exporter of any merchandise is entitled to any bounty or drawback, by act of parliament, on the exportation; in which case this debenture is a peculiar certificate signed by the officers of the customs, which entitles the trader to the receipt of such bounty or drawback. In making out these debentures, care must be taken that the paper or parchment be accompanied by a proper stamp.

DEBETS, among merchants, the sums due to them for goods sold on credit. Sometimes the word denotes the remainders of debts, part of which has been paid on account.

DE'BILE. *a.* (*debilis*, Latin.) Weak; feeble; languid; faint (*Shakspeare*)

To DEBI'LITATE, *v. n.* (*debilito*, Latin.) To weaken; to make faint; to enfeeble. (*Browne*).

DEBILITATION. *s.* (from *debilitatio*, Latin.) The act of weakening (*K. Charles*).

DEBILITY, is that feeble state of life in which the vital functions are languidly performed; when the mind loses its cheerfulness and vivacity; when the limbs are tottering with weakness, and the digestive faculty is impaired.

This complaint, which at present is so prevalent even in the bloom of life, and among those who ought to form the most vigorous and robust part of a nation, may arise from a great variety of causes, of which the following are the principal. 1. Descent from enfeebled parents. 2. Changes in the admixture and component parts of the surrounding atmosphere. 3. A sedentary and indolent mode of life. 4. Immoderate sleep; or, in a still more hurtful degree, want of the necessary portion of sleep and repose. 5. Too great exertions either of mind or body. 6. The unnecessary and imprudent use of medicines; lastly, the almost total disuse and exclusion of gymnastic exercise, and the general introduction of sedentary games, the effect of which creates an almost universal apathy to every pursuit that requires exertion.

Debility is the source of numerous disorders, such as spasms, palsy, violent evacuations, hemorrhages, putrid and nervous fevers, fainting fits, and apparent death.

Debi'lity. *s.* (*debilitas*, Latin.) Weakness; feebleness; languor; faintness (*Sidney*).

DEBONA'IR. *a.* (*debonnaire*, French.) Elegant; civil; gentle: obsolete (*Milton*).

DEBONA'IRLY. *ad.* (from *debonair.*) Elegantly; with a genteel air.

DEBT. *s.* (*debitum*, Latin.) 1. That which one man owes to another. 2. That which any one is obliged to do or suffer (*Shak.*).

Debt (National), the engagement entered into by a government, to repay at a future period money advanced by individuals for the public service, or to pay the lenders an equivalent annuity. National debts have arisen from the necessity of obtaining larger sums of money than could be raised at the time they were wanted by direct contributions; and often, when it would not have been absolutely impossible to raise the requisite sum if a heavy tax had been imposed, and strictly levied, it has been deemed more prudent to avoid the evils attendant on such a measure by the less obnoxious expedient of a loan. In most countries, the subordinate governors, to whom is generally consigned the task of providing for the public expenses, being desirous of popularity, have shewn a great predeliction for this mode of obtaining money, as it enables them to support a profuse expenditure, without appearing to oppress the people in so great a degree as they otherwise must: the system of getting into debt, or the funding system, as it is generally called, from particular funds being usually appropriated for payment of interest on the debts contracted, has therefore been adopted by most of the states of Europe, by many of the colonies, and by the American republic.

The principal advantages arising from national debts, and the system of credit on which they are founded, are, 1. The resource they afford in great emergencies, which gives a greater permanency to states, which, in former times, for want of such occasional resources, were more liable to internal derangements and to foreign subjugation. 2. The equalization of taxes. If the supplies were raised within the year, and the expences of war were considerable, every individual would be obliged, in consequence of the additional weight of his contributions, greatly to curtail his expences; and the employment of the poor, and the consumption of the rich, would be considerably diminished; whereas, when taxes are nearly equal, in time of peace and war, the value of every species of property, of industry, and the circulation of wealth, are maintained on as regular, steady, and uniform a footing, as the uncertainty and instability of human affairs will admit. 3. They retain money in the country, which would otherwise be sent out of it; public debts have more influence in this respect than all the laws against the exportation of specie that ever were made. 4. They promote circulation. The taxes which they occasion on the property of the rich, and the encouragement they hold out to the avaricious, prevent the accumulation of private hoards, and bring the whole money and personal property of a country into employment. 5. They attach the people to the government; for every individual creditor is led by his own interest to support the authority on the prosperity and existence of which the security of his property depends. The extent of this influence is so well understood, that it is not probable the government of any country where a public debt has once existed will ever permit it to be wholly paid off. 6. They encourage industry and the acquirement of property, by the facility with which individuals can lay out the surplus of their profits, without the risk of commercial bankruptcies, or the unavoidable expences and small advantage which landed estates yield, and receive interest on their capital with certainty and regularity.

The disadvantages attending the system of incurring national debts are, 1. The facility of carrying on war being much increased: while large sums can be easily borrowed, it may frequently cause wars to be protracted, which would have been much sooner brought to a termination, had the governments engaged in them experienced the difficulty of defraying the whole expence by taxation. 2. The value of the property of those who have lent their money to the state, depending on the public tranquillity, inclines them to support indiscriminately the measures of the government, whatever may be their tendency: they are interested both to preach and practise apathy under every invasion of the constitution of their country. 3. The increase of taxes to pay the interest of the debt, produces an increase in the price of all the necessaries of life, and renders it difficult for the manufacturers of a state in which this system has been carried to a great height, to maintain a successful competition with the subjects of other powers, who may be in a less embarrassed situation. 4. When a nation is encumbered with debts, a pernicious spirit of gambling is encouraged; stock-jobbing, with all its train of evil consequences, necessarily arises; and a monied interest is erected, the sole employment of which is that of drawing every possible advantage from the wants of individuals, or the necessities of the public. 5. Public debts have a very material influence on the distribution of property. Every new loan must be procured from persons already possessing considerable wealth, and such persons will not lend their money without the expectation of making a profit by it; the increase of the debt is, therefore, to them a source of increasing wealth, to which their share of the additional taxes attendant upon it bears but a small proportion; and if the government possesses no revenue but what is drawn from the people, whatever it pays to one description of men must be drawn principally from others: thus the additional income acquired by monied men, by taking advantage of the necessities of the state, is, in fact, a portion of the income of their less affluent fellow-citizens, which is transferred to them through the medium of the government, and which, in a much greater proportion than it increases their wealth, must render those poorer from whom it is drawn.

The national debt of Great Britain commenced in the reign of William III. The war which began in 1689 being very expensive, and the grants of parliament not supplying money so fast as it was wanted, the expedient of mortgaging part of the public revenue was adopted. At first the produce of particular taxes was assigned for repayment of the principal and interest of the money borrowed; large sums were also raised on life-annuities, and annuities for terms of years; and the funds established for payment of these debts being generally inadequate to the charge upon them, occasioned great deficiencies, which, at the conclusion of the war, amounted to 5,160,459*l.* 14*s.* 9¼*d.* and were charged on the continuation of various duties which had been granted for short terms. The total amount of the funded and unfunded debts in the year 1697, was 19,950,945*l.* 19*s.* 8¾*d.* The frequent anticipation of the different funds, and their general deficiency from the diminution of the revenue, in consequence of which the interest due upon money lent to government was often long in arrear, reduced public credit at this period to a very low ebb, and rendered persons who had money very reluctant in advancing it to the government, though paid what would now be called an exorbitant interest: the accumulation of the public debts caused serious apprehensions among people of property of all descriptions.

In the year 1711 a project was formed for relieving the government from the financial difficulties under which it laboured, by permitting the proprietors of various debts and arrears, amounting to 8,971,325*l.* to subscribe them towards raising the capital of a company formed for carrying on a trade to the South Seas. The actual capital of the company was 9,177,967*l.* 15*s.* 4*d.* which for the further accommodation of government was increased in 1715 to ten millions.

The total amount of the national debt on the 31st of December 1716, was 48,364,501*l.* 8*s.* 4*d.* which, on the opening of the following session of parliament, was mentioned in the king's speech and the commons' address, as an insupportable weight, and the government appears to have thought it necessary to concert seriously such measures as might lay the foundation of an effectual plan for its reduction. In consequence of this disposition, all the existing taxes, except the land and malt, were made perpetual; and, having been distributed into three classes, called the Aggregate, South Sea, and General Funds, the surplusses remaining, after satisfying the previous charges upon these respective funds, were formed into a separate fund, called the Sinking Fund, for the express purpose of discharging the principal and interest of such national debts and incumbrances as were incurred before the 25th of December, 1716. (See SINKING FUND.)

The memorable South Sea scheme, in the year 1720, was to have furnished a considerable sum to be employed in the reduction of the public debts; instead of which it increased their amount by an addition to the capital of 3,034,769*l.* 11*s.* 11*d.* while the annual charge was rather augmented than diminished by the allowance for management on the increased capital. The reduction of a part of the interest was, however, secured; and as the company's capital was redeemable, a further reduction of interest might be effected at a future period; but this depended on future circumstances, whereas had the terminable annuities which were converted into redeemable perpetuities by this scheme remained in their original state, there was a certainty of their expiring at a fixed period.

The magnitude of the public debt, and the consequent low price of the funds, appear at the end of the American war to have engaged the serious attention of the government; in consequence of which, some new taxes were imposed, in order to raise a surplus of revenue, as the foundation of a plan for establishing a new sinking fund. In order to ascertain what portion of the revenue might be appropriated to this purpose, a select committee of the house of commons was appointed to examine and state the accounts presented to the house relating to the public income and expenditure, and to report what might be expected to be the annual amount of the income and expenditure in future. On the 21st March, 1786, the committee made their report; and conceiving that the circumstances of the times rendered any average drawn from the amount of the revenue in former periods in a great degree inapplicable to the situation of the country, they formed an account of the public receipt and expenditure to Michaelmas 1785, and to January 1786, from which it appeared, that at the former period there was a surplus of 901,001*l.*, and at the latter a surplus of 919,290*l.* As it was evident that a fund of less than one million per annum would be very inadequate to the purpose for which it was designed, new taxes were imposed for raising the surplus revenue to this sum; and in order the more effectually to prevent ministers from diverting it to any other purpose, the mode was adopted which had been frequently suggested, of vesting the annual sum in the hands of commissioners; some other judicious regulations were also established by the act passed for this purpose. (See SINKING FUND.)

In the year 1789 it was found necessary to borrow 1,005,140*l.* on a tontine scheme, and 187,000*l.* to replace the like sum which had been issued out of the civil list revenue, as a loan to the prince of Orange: the latter was raised on annuities for 18¼ years. The total amount of the public debt in the year 1792, being the year previous to the war with the French republic, was, according to the official account, 238,231,248*l.*; but including the value of the terminable annuities, and the amount of the unfunded debt, the total was 268,267,272*l.* 1*s.* 7*d.*, the annual interest and charges of management on which amounted to 9,752,673*l.* 14*s.* 8*d.* From this amount, however, a deduction is to be made of the stock which had been redeemed by the operation of the sinking fund. With this formidable burthen on the property and industry of the country, a war was entered into, which, from the enormous expenditure attending it, increased the amount of the national debt in a degree beyond all former precedent or conjecture.

As our limits will not allow of our going farther into detail here; we present the reader with the following table, exhibiting the progress of the national debt from its commencement to Midsummer, 1802.

	CAPITAL.	INTEREST.
National Debt at the Revolution, 1688	£. 664,263	39,855
Increase during the reign of William III.	15,730,439	1,271,087
Amount at the accession of Queen Anne	16,394,702	1,310,942
Increase during the reign of Queen Anne	31,969,799	1,841,582
Amount at establishment of Sinking Fund, 1716	48,364,501	3,152,524
Increase during the reign of Geo. I.	4,654,654	
Decrease of annual charge		941,958
Amount at the accession of Geo. II.	53,019,155	2,210,566
Decrease during the Peace	6 064,532	246,541
Amount at commencement of the War, 1739	46,954,623	1,964,025
Increase during the War	31,338,689	1,096,979
Amount at the end of the War in 1748	78,293,312	3,061,004
Decrease during the Peace	3,312,426	389,364
Amount at the commencement of the War, 1755	74,980,886	2,671,640
Increase during the War	66,710,427	2,033,094

Amount at the end of the War, 1762	£.141,691,313	4,706,734
Decrease during the Peace	5,748,262	229,913
Amount at commencement of the American War	135,943,051	4,476,821
Increase during the War	132,157,328	5,035,411
Amount at the conclusion of the American War	268,100,379	9,512,232
Increase in the year 1789	1,189,140	56,863
Amount in 1789	269,289,519	9,569,095
Redeemed during the Peace	9.441,850	283,255
Amount at the commencement of the War in 1793	259,847,669	9,285,840
Increase during the War	350,013,508	11,988,633
	609,861,177	21,274,473
Redeemed during the War	69,243,336	2,089,220
Amount at conclusion of the War in 1802	540,617,841	19,185,253

Since the period at which the above statement terminates, another war has been entered into, which has already added many millions to the public debt; but as the sum to which it may be increased is beyond the reach even of probable estimate, we can only give the following statement of the total amount of the debt on the 1st February, 1808, which will also shew the different descriptions of Stock and Annuities of which it consists:

National Debt.

	£.	s.	d.
Consolidated 3 per Cent. Annuities	422,975,433	4	5¼
Reduced 3 per Cent. Annuities	174,712,794	7	10
3 per Cent. Annuities 1726	1,000,000	0	0
Old and New South-Sea Annuities	24,065,084	13	11¼
3 per Cent. Annuities 1751	1,919,600	0	0
Imperial 3 per Cent Annuities	3,669 300	0	0
Consolidated 4 per Cent. Annuities	49,725,084	17	2
Consolidated 5 per Cent. Annuities	46,674,742	1	8
5 per Cent Annuities 1797 and 1802	2,070,043	16	9
Bank of England	11,686,800	0	0
	738,498,883	1	9¾
Transferred for Land Tax redeemed to the 1st of February 1808	22,976,829	10	4
	715,522,053	11	5¾
Redeemed by the Commissioners for the Reduction of the Debt	133,395,454	0	0
Debt unredeemed on the 1st of February 1808	£.582,126,599	11	5¾

*** The Long Annuities and other terminable Annuities, having no determinate capital, are not included in the above statement.

Unfunded Debts and Demands outstanding on the 5th of January 1808.

	£.	s.	d.
Exchequer Bills *	28,942,900	0	0
Ditto Bank Charter	3,000,000	0	0
Treasury Bills, Warrants, &c.	727,100	13	1¾
Army	1,063,036	10	11
Barracks	476,586	0	8
Ordnance	1,165,822	13	7
Navy	6,561,237	9	1¼
Civil List Advances	50,430	2	6
	£.41,987,113	9	11

* Of the above sum 2,363,100*l.* has been funded, pursuant to a vote of the House of Commons of the 10th of March 1808. (*Gregory, Grellier, Letts, Nicholson, Morgan, and Rees.*)

On this subject, much more information may be gathered from Price on the National Debt, sir John Sinclair's History of the Public Revenue, Morgan's Tracts on the Public Finances, The History of our Debts and Taxes, &c.

DE'BTED. *particip.* (from *debt.*) Indebted; obliged to (*Shakspeare*).

DE'BTOR. *s.* (*debitor*, Latin.) 1. He that owes something to another (*Swift*). 2. One that owes money (*Philips*). 3. One side of an account book (*Addison*).

DEBULLITION. *s.* (*debullitio*, Lat.) A bubbling or seething over.

DECACHORDON, in antiquity, a musical instrument of ten strings, much resembling our harp.

DECACU'MINATED. *a.* (*decacuminatus*, Latin.) Having the top or point cut off.

DECADE, a word used by some old writers for the number ten, and decades for an enumeration by tens. The word is formed from the Latin decas, which is derived from a Greek word of the same import. It has been more peculiarly appropriated to the number of books, q. d. decades, into which the Roman History of Titus Livius is divided. Hence also came decadal arithmetic, the Decameron of Boccacio, &c. The French adopted the computation of time by decades in their new calendar.

DE'CADENCY. *s.* (*decadence*, Fr.) Decay.

DECAGON, a plane geometrical figure of ten sides and ten angles. When all the sides and angles are equal, it is a regular decagon, and may be inscribed in a circle; otherwise, not.

If the radius of a circle, or the side of the inscribed hexagon, be divided in extreme and mean proportion, the greater segment will be the side of a decagon inscribed in the same circle. And therefore, as the side of the decagon is to the radius, so is the radius to the sum of the two. Whence, if the radius of the circle be *r*, the side of the inscribed decagon will be $\frac{\sqrt{5}-1}{2} \times r$.

If the side of a regular decagon be 1, its area will be $\frac{5}{2}\sqrt{5+2\sqrt{5}} = 7\cdot6942088$; therefore as 1 is to 7·6942088, so is the square of the side of any regular decagon, to the area of the same: so that, if s be the side of such a decagon, its area will be equal to $7.6942088s^2$. (See REGULAR FIGURE.)

DECAGYNIA. (δεκα, ten, and γυνη, a woman or wife.) Ten-styled. The name of one of the orders in Linnéus's artificial system; comprehending those flowers which have ten styles. This occurs only in the class decandria.

DECALOGUE, the ten precepts or commandments delivered by God to Moses, after engraving them on two tables of stone. The Jews, by way of excellence, call these commandments the ten words, from whence they had afterwards the name of decalogue: but it is to be observed, that they joined the first and second into one, and divided the last into two. They understand that against stealing to relate to the stealing of men, or kidnapping; alleging, that the stealing one another's goods or property is forbidden in the last commandment. The church of Rome has struck the second commandment quite out of the decalogue; and to make their number complete, has split the tenth into two: the reason of which may be easily conceived.

DECAMERIS, a musical term, used by Sauveur and others, to denote the $\frac{1}{301}$ of an octave. See MERIS.

To **DECA'MP.** *v. n.* (*decamper*, French.) To shift the camp; to move off.

DECA'MPMENT. *s.* (from *decamp.*) The act of shifting the camp.

DECANDRIA. (δεκα, ten, and ανηρ, a man or husband.) Ten-stamened. The name of the tenth class in Linnéus's artificial system; comprehending all hermaphrodite flowers with ten stamens. It is also the name of an order in the classes monadelphia, diadelphia, gynandria, and diœcia.

To **DECA'NT.** *v. a.* (*decanto*, Latin.) To pour off gently by inclination (*Boyle*).

DECANTA'TION. *s.* (*decantation*, Fr.) The act of decanting or pouring off clear.

DECA'NTER. *s.* (from *decant.*) A glass vessel made for pouring off liquor clear.

DECANUS, among the Romans, an officer who had ten other officers, or persons, under his charge; whence our English dean.

DECAPHYLLOUS CALYX. In botany, a ten-leaved calyx; as in hibiscus.

To **DECA'PITATE.** *v. a.* (*decapito*, Lat.) To behead.

DECAPROTI, DECEMPRIMI, among the ancients, were officers who gathered the tributes, or taxes.

DECASMUS, Δεκασμος, in antiquity, the name of an action or process among the Athenians, which was brought against any person who offered a bribe.

DECASTYLE, a building with ten columns in front.

To **DECA'Y.** *v. n.* (*decheoir*, Fr.) To lose excellence; to decline from the state of perfection; to be gradually impaired (*Pope*).

To DECA'Y. *v. a.* To impair; to bring to decay (*Clarendon*.

DECA'Y. *s.* (from the verb.) 1. Decline from the state of perfection; state of depravation or diminution (*Pope*). 2. The effects of diminution; the marks of decay (*Locke*). 3. Declension from prosperity (*Shakspeare*). 4. The cause of decline (*Bacon*).

DECA'YER. *s.* (from *decay.*) That which causes decay (*Shakspeare*).

DECCAN, an extensive tract of country in Asia, which, according to the signification of its name (the South), has been supposed to include the whole region south of Hindustan Proper. But, in its more accurate sense, it contains only the countries situate between Hindustan Proper, the Carnatic, the Western Sea, and Orissa; namely, the provinces of Candeish, Doulatabad, Visiapour, Golconda, and the W. part of Berar.

DECE'ASE. *s.* (*decessus*, Latin.) Death; departure from life (*Hooker*).

To DECE'ASE. *v. n.* (*decedo*, Latin.) To die; to depart from life (*Chapman*).

DECE'IT. *s.* (*deceptio*, Latin.) 1. Fraud; a cheat; a fallacy (*Job*). 2. Stratagem; artifice (*Shakspeare*).

DECE'ITFUL. *a.* (*deceit* and *full.*) Fraudulent; full of deceit (*Shakspeare*).

DECE'ITFULLY. *ad.* Fraudulently (*Wotton*).

DECE'ITFULNESS. *s.* (from *deceitful.*) Tendency to deceive (*Matthew*).

DECE'IVABLE. *a.* (from *deceive.*) 1. Subject to fraud; exposed to imposture. 2. Subject to produce error; deceitful (*Bacon*).

DECE'IVABLENESS. *s.* (from *deceivable.*) Liableness to be deceived (*Gov. of the Tongue*).

To DECE'IVE. *v. a.* (*decipio*, Latin.) 1. To cause to mistake; to bring into errour; to impose upon (*Locke*). 2. To delude by stratagem. 3. To cut off from expectation (*Locke*). 4. To mock; to fail (*Dryden*). 5. To deprive by fraud or stealth (*Bacon*).

DECE'IVER. *s.* (from *deceive.*) One that leads another into errour; a cheat (*South*).

DECEMBER, the last month in the year, wherein the sun enters the tropic of Capricorn, and makes the winter solstice. In Romulus's year, December was the tenth month, whence the name, viz. from decem, ten. This month contains 31 days.

DECEMFIDOUS CALYX. In botany. A ten-cleft calyx, or rather perianth. As in potentilla and fragaria. See CLEFT.

DECEMLO'CULAR PERICARP. In botany. A ten-celled pericarp or seed-vessel; as in linum.

DECEMPEDA, Δεκαπους, ten-feet rod; an instrument used by the ancients in measuring.

DECE'MPEDAL. *a.* (from *decempeda*, Latin.) Ten feet in length.

DECE'MVIRATE.*s.* (*decemviratus*, Lat.) The dignity and office of the ten governours of Rome; any body of ten men.

DECE'MVIRI, an order of annual magistrates among the Romans, created with a sovereign power to draw up and make laws for the people; thus called, because their number was ten. To the decemviri was given all the legislative authority ever enjoyed by the kings, and after them by the consuls. One among them had all the ensigns and honours of the function; and the rest had the like in their turn, during the year of their decemvirate. They were originally two in number, called duumviri, till the year of Rome 388, when their number was increased to ten; five chosen from the plebeians and five from the patricians. Sylla increased their number to fifteen, called quindecemvirs.

DE'CENCE. DE'CENCY. *s.* (*decence*, Fr.) 1. Proper formality; becoming ceremony (*Spenser*). 2. Suitableness to character; propriety (*South*). 3. Modesty; not ribaldry; not obscenity (*Roscommon*).

DECENNALIA, ancient Roman festivals, celebrated by the emperors every tenth year of their reign, with sacrifices, games, and largesses for the people. The emperor Augustus first instituted these solemnities.

DECE'NNIAL. *a.* (from *decennium*, Latin.) What continues for the space of ten years.

DECENNO'VAL. DECENNO'VARY. *a.* (*decem* and *novem*, Latin.) Relating to the number nineteen (*Holder*).

DE'CENT. *a.* (*decens*, Latin.) 1. Becoming; fit; suitable (*Dryden*). 2. Grave; not gaudy (*Milton*). 3. Not wanton; not immodest.

DE'CENTLY. *ad.* 1. In a proper manner; with suitable behaviour; without ostentation (*Broome*). 2. Without immodesty (*Dryden*).

DECEPTIBI'LITY. *s.* (from *deceit.*) Liableness to be deceived (*Glanville*).

DECE'PTIBLE. *a.* (from *deceit.*) Liable to be deceived; subject to fraud (*Brown*).

DECE'PTION. *s.* (*deceptio*, Latin.) 1. The act or means of deceiving; cheat; fraud; fallacy (*South*). 2. The state of being deceived (*Milton*).

DECE'PTIOUS. *a.* (from *deceit.*) Deceitful.

DECE'PTIVE. *a.* (from *deceit.*) Having the power of deceiving.

DECE'PTORY. *a.* (from *deceit.*) Containing means of deceit.

DE'CERPT. *a.* (*decerptus*, Latin.) Cropped; taken off.

DECE'RPTIBLE. *a.* (*decerpo*, Lat.) That may be taken off.

DECE'RPTION. *s.* (from *decerpt.*) The act of cropping or taking off.

DECERTA'TION. *s.* (*decertatio*, Lat.) A contention; a striving; a dispute.

DECE'SSION. *s.* (*decessio*, Latin.) A departure; a going away.

DECHALES (Claudius Francis Milliet), an excellent mathematician, mechanist, and astronomer, descended from a noble family, was born at Chamberry in 1611. His principal performances are an edition of Euclid's Elements, in which the unserviceable propositions are rejected, and the use of those retained is shewn; a Discourse on Fortification; and another on Navigation. These with others have been collected, first in three vols. folio, afterwards in four, under the title of Mundus Mathematicus: being, indeed, a tolerably complete course of mathematics. He died in 1678, professor of mathematics, at Turin.

To DECHA'RM. *v. a.* (*decharmer*, Fr.) To counteract a charm; to disenchant (*Harvey*).

To DECI'DE. *v. a.* (*decido*, Latin.) 1. To fix the event of; to determine (*Dryden*). 2. To determine a question or dispute (*Glanville*).

DE'CIDENCE. *s.* (*decidentia*, Latin.) 1. The quality of being shed, or of falling off. 2. The act of falling away (*Brown*).

DECI'DER. *s.* (from *decide.*) 1. One who determines causes (*Watts*). 2. One who determines quarrels.

DECIDUA. (*decidua membrana*, from *decido*, to fall down.) Membrana decidua. In anatomy, a very thin and delicate membrane or tunic, which adheres to the gravid uterus, and is said to be a reflection of the chorion, and, on that account, is called decidua reflexa. The tunica decidua comes away after delivery in small pieces mixed with the lochia.

DECIDUOUS LEAF. (*deciduus.*) In botany, falling off in the autumn. Calyx or perianth: falling after the corol opens; as in berberis, and the class tetradynamia. Corol or petals: falling off with the rest of the flower. Applied also to stipules; as in padus, cerasus, populus, tilia, ulmus, quercus, and many other trees; bractes, and legumes. See Caducous.

DECI'DUOUSNESS. *s.* (from *deciduous.*) Aptness to fall.

DECIL, in astronomy, the aspect of two planets which are 36° distant from each other.

DE'CIMAL. *a.* (*decimus,* Lat.) Numbered by ten; multiplied by ten.

Decimals, any thing proceeding by tens; as decimal arithmetic, decimal fractions, decimal scales, &c.

Decimal arithmetic, in a general sense, may be considered as the common arithmetical computation in use, in which the decimal scale of numbers is used, or in which the places of the figures change their value in a tenfold proportion. In this sense, the word includes both the arithmetic of integers, and decimal fractions. In a more restrained sense, however, it means only

Decimal fractions, which are fractions whose denominator is always a 1 with some number of ciphers annexed, more or fewer according to the value of the fraction, the numerator of which may be any number whatever; as $\frac{1}{10}$, $\frac{3}{100}$, $\frac{7}{1000}$. See the treatise on Arithmetic in our first volume.

To DE'CIMATE. *v. a.* (*decimus,* Lat.) To tithe; to take the tenth.

DECIMA'TION. *s.* (from *decimate.*) 1. A tithing; a selection of every tenth. 2. A selection by lot of every tenth soldier for punishment (*Dryden*).

To DECI'PHER. *v. a.* (*dechiffrer,* Fr.) 1. To explain that which is written in ciphers (*Sidney*). 2. To unfold; to unravel; to explain. 3. To write out; to mark down in characters (*South*). 4. To stamp; to characterize; to mark (*Shakspeare*).

DECI'PHERER. *s.* (from *decipher.*) One who explains writings in cipher.

DECI'SION. *s.* (from *decide.*) 1. Determination of a difference (*Woodward*). 2. Determination of an event (*Shakspeare*).

DECI'SIVE. *a.* (from *decide.*) 1. Having the power of determining any difference; conclusive (*Rogers*). 2 Having the power of settling any event (*Philips*).

DECI'SIVELY. *ad.* (from *decisive.*) In a conclusive manner.

DECI'SIVENESS. *s.* (from *decisive.*) The power of argument or evidence to terminate any difference, or settle an event.

DECI'SORY. *a.* (from *decide.*) Able to determine or decide.

DECIUS, a Roman emperor, born A.D. 201, in Pannonia. The emperor Philip sent him to quell a sedition in Mœsia; but instead of obeying his directions, he turned his arms against him, and on his death assumed the imperial diadem. He distinguished himself by his expedition against the Persians, and by his persecution of the Christians. In his march against the Goths, he entered into a bog, where he and his army perished by the attack of the enemy, A.D. 251.

To DECK. *v. a.* (*decken,* Dutch.) 1. To cover; to overspread (*Milton*). 2. To dress; to array (*Shakspeare*). 3. To adorn; to embellish (*Prior*).

Deck of a ship, is a planked floor from stem to stern, upon which the guns lie, and where the men walk to and fro. Great ships have three decks, first, second, and third, beginning to count from the lowermost. Half-deck reaches from the main-mast to the stem of the ship. Quarter-deck is that aloft the steerage, reaching to the round house. Flush-deck is that which lies even in a right line fore and aft, from stem to stern. A rope-deck is made of cordages, interwoven and stretched over a vessel, through which it is easy to annoy an enemy who comes to board her. They are little used but by small vessels, to defend them from privateers. See Ship-building.

DECKENDORF, a town of Lower Bavaria, seated near the Danube. Lat. 48. 42 N. Lon. 12. 55 E.

DE'CKER. *s.* (from *deck.*) A dresser; one that apparels or adorns; a coverer.

To DECLA'IM. *v. n.* (*declamo,* Lat.) To harangue; to speak to the passions; to rhetoricate; to speak set orations (*Ben Jonson*).

DECLA'IMER. *s.* (from *declaim.*) One who makes speeches with intent to move the passion (*Addison*).

DECLAMA'TION. *s.* (*declamatio,* Lat.) A discourse addressed to the passions; an harangue; a set speech (*Taylor*).

Among the Greeks, declamation was the art of speaking indifferently on all subjects, and on all sides of a question; of making a thing appear just that was unjust; and of triumphing over the best and soundest reasons. Such sort of declamations, M. de St. Evremond observes, were fit only to corrupt the mind, by accustoming men to cultivate their imagination, rather than to form their judgment, and to seek for verisimilitudes to impose upon, rather than solid reasons to convince, the understanding. It is said that a certain orator, named Plotius Gallus, first introduced the use of declamations at Rome. In this way Cicero formed himself for eloquence. The term frequently occurs both in Horace and Juvenal. Among us, declamation is restrained to certain exercises, which scholars perform, to teach them to speak in public. We say, a declamation against Hannibal, against Pyrrhus, the declamation of Quintilian, &c.

In the colleges of the Jesuits, declamations are little theatrical or dramatic performances, consisting of a few scenes not divided into acts, rehearsed by the students by way of exercise, and to form them for speaking in public.

DECLAMATOR. *s.* (Lat.) A declaimer; an orator (*Tatler*).

DECLA'MATORY. *a.* (*declamatorius*, Lat.) 1. Relating to the practice of declaiming; pertaining to declamation (*Wotton*). 2. Appealing to the passions (*Dryden*).

DECLA'RABLE. *a.* (from *declare.*) Capable of proof or illustration (*Brown*).

DECLARA'TION. *s.* (from *declare.*) 1. A proclamation or affirmation; open expression; publication (*Tillotson*). 2. (In law.) The showing forth of an action personal in any suit, though it is used sometimes for real actions (*Cowell*).

DECLA'RATIVE. *a.* (from *declare*). 1. Making declaration; explanatory (*Grew*). 2. Making proclamation (*Swift*).

DECLA'RATORILY. *ad.* (from *declaratory.*) In the form of a declaration; not in a decretory form (*Brown*).

DECLA'RATORY. *a.* (from *declare.*) Affirmative; expressive; not decretory; not promissory (*Tillotson*).

To DECLA'RE. *v. a.* (*declaro*, Latin.) 1. To clear; to free from obscurity (*Boyle*). 2. To make known; to tell evidently and openly (*Dryden*). 3. To publish; to proclaim (*Chronicles*). 4. To show in open view (*Addison*).

To **Decla're.** *v. n.* To make a declaration; to proclaim some resolution (*South*).

DECLA'REMENT. *s.* (from *declare.*) Discovery; declaration; testimony (*Brown*).

DECLA'RER. *s.* (from *declare.*) A proclaimer; one that makes any thing known.

DECLE'NSION. *s.* (*declensio*, Latin.) 1. Tendency from a greater to a less degree of excellence (*South*). 2. Declination; descent (*Burnet*).

Declension, in grammar, an inflection of nouns according to their cases, as nominative, genitive, dative, &c. It is a different thing in the modern languages, which have not properly any cases, from what it is in the ancient Greek and Latin. With respect to languages where the nouns admit of changes either in the beginning, the middle, or ending, declension is properly the expression of all those changes in a certain order, and by certain degrees called cases. With regard to languages where the nouns do not admit of changes in the same number, declension is the expression of the different states a noun is in, and the different relations it has; which difference of relations is marked by particles, as *of*, *to*, *from*, *by*, &c.

DECLI'NABLE. *a.* (from *decline.*) Having variety of terminations.

DECLINATE STEM. In botany, a declined or declining stem. Descending archwise. The least degree of curvature towards the earth. Opposed to ascending.—Applied also to the peduncle, stamen, and style, as likewise to the leaf.

DECLINA'TION. *s.* (*declinatio*, Latin.) 1. Descent; change from a better to a worse state; decay (*Waller*). 2. The act of bending down. 3. Variation from rectitude; oblique motion; obliquity (*Bentley*). 4. Variation from a fixed point (*Woodward*).

Declination, in astronomy, the distance of the sun, a star, planet, or other point of the sphere of the world, from the equator, either northward or southward. It is the same with latitude in geography. Declination is either real or apparent, according as the real or apparent place of the object is considered.

The declination of any heavenly body, as of a star, may be easily found by the following rule: Take the meridian altitude of the star, at any place where the latitude is known; the complement of this is the zenith distance, and is called north or south, as the star is north or south at the time of observation. Then, 1. When the latitude of the place and zenith distance of the star are of different kinds, namely, one north and the other south, their difference will be the declination; and it is of the same kind with the latitude, when that is the greatest of the two, otherwise it is of the contrary kind. 2. If the latitude and the zenith distance are of the same kind, *i. e.* both north, or both south, their sum is the declination; and it is of the same kind with the latitude. (*O. Gregory's Astron. pa.* 34).

Accurate tables of the sun's declination are published regularly in the nautical almanacs.

Declination (Parallels of), are small circles of the sphere parallel to the equator.

Declination (Parallax, or Refraction of), is such an arch of a meridian as is equal to the change produced in the declination by parallax or refraction, respectively.

Declination of the magnetic needle, is the distance of the magnetic from the true meridian in degrees measured upon the horizon. Inclination is the angle which the dipping needle makes with the horizon, as measured on a vertical or azimuth circle. The changes in the declination and inclination may be represented by the words *variation* and *alteration* respectively.

After the discovery of that most useful property of the magnet, or loadstone, namely, the giving hardened iron and steel a polarity, the compass was for many years used without knowing that its direction in any-wise deviated from the poles of the world; and about the middle of the 16th century, so certain were some of its inflexibly pointing to the north, that they treated with contempt the notion of the variation, which about that time began to be suspected. However, careful observations soon discovered, that in England and its neighbourhood, the needle pointed to the eastward of the true north; but the quantity of this deviation being known, mariners became as well satisfied as if the compass had none; because they imagined that the true course could be obtained by making allowance for the true declination.

From successive observations made afterwards, it was found that the deviation of the needle from the north was not a constant quantity, but that it gradually diminished; and at last, about the year 1658 or 1660, it was found at London that the needle pointed due north, and has ever since been getting to the westward; and now the declination is more than 24° to the westward of the north: so that in any one place it may be suspected the declination has a kind of libratory motion, traversing through the north to unknown limits eastward and westward. But the settling of this point must be left to time.

During the time of the said observations it was also discovered that the declination of the needle was different in different parts of the world, it being west in some places when it was east in others; and in places where the declination was of the same name, yet the quantity of it greatly differed. It was therefore found necessary, that mariners should every day, or as often as they had opportunity, make during their voyage proper observations for an amplitude or azimuth; whereby they might be enabled to find the declination of the compass in their present place, and thence correct their courses.

The following table of declinations for different times and places was given by Dr. Halley, in No. 148 of the Philosophical Transactions, and is that on which he founded his theory.

Observed Declinations of the Needle in divers places, and at divers times.

Places observed at.	Longitude from London.	Latitude.	Year of Observation.	Declination observed.
	° ′	° ′		° ′
London.......	0 0	51 31 n	1580	11 15 e
			1622	6 0 e
			1634	4 5 e
			1672	2 30 w
			1683	4 30 w
Paris.	2 25 e	48 51 n	1640	3 0 e
			1666	0 0
			1681	2 30 w
Uraniburg.....	13 0 e	55 54 n	1672	2 35 w
Copenhagen...	12 53 e	55 41 n	1649	1 53 e
			1672	3 45 w
Dantzic	19 0 e	54 23 n	1679	7 0 w
Montpelier....	4 0 e	43 37 n	1674	1 10 w
Brest.........	4 25 w	48 23 n	1680	1 45 w
Rome.........	13 0 e	41 50 n	1681	5 0 w
Bayonne......	1 20 w	43 30 n	1680	1 20 w
Hudson's Bay..	79 40 w	51 0 n	1668	19 15 w
In Hudson's Straits....	57 0 w	61 0 n	1668	29 30 w
Baffin's Bay, Sir T. Smith's Sound.....	80 0 w	78 0 n	1616	57 0 w
At sea........	57 0 w	38 40 n	1682	7 30 w
At sea........	31 30 w	43 50 n	1682	5 30 w
At sea........	42 0 w	21 0 n	1678	0 40 e
Cape St. Augustine....	35 30 w	28 0 s	1670	5 30 e
Off the mouth of River Plate	53 0 w	39 30 s	1670	20 30 e
Cape Frio.....	41 10 w	22 40 s	1670	12 10 e
Entrance of Magellan's Straits....	68 0 w	52 30 s	1670	17 0 e
West entrance of ditto	75 0 w	53 0 s	1670	14 10 e
Baldivia.......	73 0 w	40 0 s	1670	8 10 e
Cape Aguillas..	16 30 e	34 50 s	1622	2 0 w
			1675	8 0 w
At sea........	1 0 e	34 30 s	1675	0 0
At sea........	20 0 w	34 0 s	1675	10 30 e
At sea........	32 0 w	24 0 s	1675	10 30 e
St. Helena.....	6 30 w	16 0 s	1677	0 40 e
Isle Ascension..	14 30 w	7 50 s	1678	1 0 e
Johanna.......	44 0 e	12 15 s	1675	19 30 w
Mombasa.....	40 0 e	4 0 s	1675	16 0 w
Zocatra.......	56 0 e	12 30 n	1674	17 0 w
Aden, Mouth of Red Sea	47 30 e	13 0 n	1674	15 0 w
Diego Roiz....	61 0 e	20 0 s	1676	20 30 w
At sea........	64 30 e	0 0	1676	15 30 w
At sea........	55 0 e	27 0 s	1676	24 0 w
Bombay.......	72 30 e	19 0 n	1676	12 0 w
Cape Comorin.	76 0 e	8 15 n	1680	8 48 w
Ballasore......	87 0 e	21 30 n	1680	8 10 w
Fort St. George	80 0 e	13 15 n	1680	8 10 w
West Point of Java.......	104 0 e	6 40 s	1676	3 10 w
At sea........	58 0 e	39 0 s	1677	27 30 w
I. St. Paul.....	72 0 e	38 0 s	1677	23 30 w
At Van Diemen's	142 0 e	42 25 s	1642	0 0
At New Zealand.......	170 0 e	40 50 s	1642	9 0 e
Three-kings Isle in ditto	169 30 e	34 35 s	1642	8 40 e
I. Rotterdam in the South Sea	184 0 e	20 15 s	1642	6 20 e
Coast of New Guinea....	149 0 e	4 30 s	1643	8 45 e
West Point of ditto......	126 0 e	0 26 s	1643	5 30 e

At London, the declination,

in 1580	was	11°	15′ E.
in 1622	-	6	0 E.
in 1634	-	4	5 E.
in 1658	-	0	0
in 1672	-	2	30 W.
in 1692	-	6	0 W.
in 1723	-	14	17 W.
in 1747	-	17	40 W.
in 1780	-	22	41 W.

And in the month of July from 1790 downwards, as below:

1790	23° 39′ ·0 W.	1799	24° 1′ ·8 W.
1791	23 36 ·7	1800	24 3 ·0
1793	23 50 ·5	1801	24 4 ·1
1794	23 54 ·4	1802	24 6 ·0
1795	23 57 ·1	1803	24 7 ·9
1796	23 59 ·2	1804	24 8 ·4
1797	24 0 ·3	1805	24 7 ·8
1798	24 0 ·0	1806	24 8 ·6

So that the declination here, seems oscillating about a limit.

According to the observations of Mr. Canton for the year 1759 (Phil. Trans. vol. 51. pa. 445.) it appears that the diurnal variation of declination increased from 7′ 8″ in January, to 13′ 21″ in June, and decreased to about 6′ 58″ in December.

Mr. Gilpin found (Phil. Trans. 1806, part ii.) by a mean of 12 years from 1793 to 1805, that the declination appeared to increase or go westward from the winter solstice to the vernal equinox, 0′·80; to diminish or go eastward from the vernal equinox to the summer solstice, 1′·43; to increase again from the summer solstice to the autumnal equinox, 2′·43; and to decrease only 0′·14 from thence to the winter solstice.

Mr. Thomas Harding, in the Transactions of the Royal Irish Academy, vol. iv. has given observations on the declination of the magnetic needle at Dublin, which are rather extraordinary. He says the change in the declination at that place is uniform. That from the year 1657, in which the declination was nothing (the same as at London in that year), it has been going on at the medium rate of 12′20″ annually, and was in May 1791, 27° 23′ west: exceeding that at London by 3 or 4 degrees. We know not whether observations subsequent to 1791 favour the same result.

At Paris, according to Orontius Finæus, the declination was,

in 1550	-	8°	0′ E.
in 1640	-	3	0 E.
in 1660	-	0	0
in 1681	-	2	2 W.
in 1759	-	18	10 W.
in 1760	-	18	20 W.
From 1792 to 1794	-	21	54 W.
1798	-	22	15 W.
1799	-	22	0 W.
1800	-	22	12 W.
1801	-	22	1 W.
1802	-	21	45 W.
1803	-	21	59 W.
1804	-	22	15 W.

The declinations during this period appearing obviously to vacillate about a limit.

M. Burckardt, an ingenious French astronomer, invented a formula to represent the magnetic declinations observed at Paris; thus, if t denote the number of years from 1663, the tangent of the declination is $0{\cdot}449 \sin.(25'7'')\,t + 0{\cdot}0425\,[\sin.(50'13'')\,t]^2 + 0{\cdot}0267\,[\sin.(1^\circ 40' 26'')\,t]^4$. It follows from this formula that the eastern declination diminished from 1448, when it was at its maximum of 24° 10′, to 1660 or 1663, when it was nothing at Paris. Reckoning an equal period backward from 1448 gave 1233 for the earlier epoch when there was no declination. A little before this the invention of the mariner's compass is generally dated. According to Burckardt's theorem, the maximum of western declination at Paris will be in the year 1831; though it will not vary more than 20 minutes from that time to 1878. We mention these as curious results of this astronomer's formula; but would by no means be understood as affirming their accuracy.

According to Mr. James Robertson (Phil. Trans. 1806), the magnetic declination at Jamaica has undergone no change since the year 1660, or more than 140 years. Indeed, observations prove abundantly, that the variations of the declination compared with one another in different points of the globe, follow different relations. But there is a fact extremely worthy of attention, that has been remarked by the celebrated Hallé, on the mere inspection of the table of declination published by Van Swinden, whose notice it had escaped. In the table, three places are pointed out, where the needle has experienced the greatest declination: and these are, first, in the middle of the Indian ocean, from 10° to 15° of south latitude, and from 82° to 87° of east longitude (reckoning from the isle of Ferro), where the variation, from the year 1700 to that of 1756, was from 11° to 11° 15′. Secondly, in the Ethiopian ocean, from 5° of north to 20° or 25° of south latitude, and in the interval of 10°, 15°, and 20°, of east longitude; the variation relative to this space, during the same period of time, was from 10° to 10° 45′, principally under the line and to 5° southward. Thirdly, at 50° north latitude, and between 17° of east and 10° of west longitude; where again, in the same period, there was a variation of from 11° to 11° 45′.

Looking at Van Swinden's table, Hallé perceived that these three places formed as it were three centres, round which the numbers indicating the quantities of variation insensibly decreased in proportion as we departed from each centre; so that we have here a new order of observations, answering to the places where the variation was least in the same course of years.

These places are, first, the whole American ocean, without including the gulf of Mexico, that is to say, from the western point of Africa to the farthest of the Bermuda islands. And here also we must remark, that in the ocean between Africa and North America, the variation is much less towards the American than towards the African coasts. Secondly, the environs of the isle of Madagascar, and part of the coast of Zanguebar. Thirdly, that part of the ocean which is to the south and south-east of the Sunda islands, between those islands and New Holland. And lastly, in the same sea, about the 4th degree of south latitude and the 97th of east longitude, that is, in the middle of the space comprised between the western angle of New Holland and the southern point of Africa. In all these different places the declination of the needle has not varied, during the whole 56 years, so much as one degree. (*Encyclop. Méthod.*).

Dr. Halley published in the last century a theory of the variations of the compass. In this work he supposes there are four magnetic poles in the earth; two of which are fixed and two moveable, by which he explains the different variation of the compass at different times in the same place. But it is impossible to apply exact calculations to so complicated an hypothesis. M. Euler, son of the celebrated geometrician of that name, has however shown, that two magnetic poles placed on the surface of the earth will sufficiently account for the singular figure assumed by the lines which pass through all the points of equal variation in the chart of Dr. Halley.

M. Euler first examines the case wherein the two magnetic poles are diametrically opposite; second, he places them in the two opposite meridians, but at unequal distances from the poles of the world; third, he places them in the same meridians. Finally, he considers them situated in two different meridians. These four cases may become equally important; because, if it is determined that there are only two magnetic poles, and that these poles change their situations, it may some time hereafter be discovered that they pass through all the different positions.

Since the needle of the compass ought always to be in the plane which passes through the place of observation and two magnetic poles, the problem is reduced to the discovery of the angle contained between this plane and the plane of the meridian. M. Euler, after having examined the different cases, finds that they also express the earth's magnetism, represented in the chart published by Messrs. Mountaine and Dodson in 1744, particularly throughout Europe and North America, if the following principles are established.

Between the arctic pole and the magnetic pole 14° 53′.

Between the antarctic pole and the other magnetic pole 29° 23′.

53° 18′ the angle at the north pole, formed by the meridian's passing through the two magnetic poles.

250° the longitude of the meridian, which passes over the northern magnetic pole.

As the observations which have been collected with regard to the variation are for the most part loose and inaccurate, it is impossible to represent them all with precision; and the great variations observed in the Indian ocean seem to require, says M. Euler, that the three first quantities should be 14, 35, and 65 degrees.

In the Memoir of MM. Biot and Humboldt "On the variations of the terrestrial magnetism in different latitudes," the position of the magnetic equator is determined from direct observations. The inclination of the plane of this circle to the astronomical equator is stated to be 10° 58′ 56″, its occidental node on that equator being at 120° 2′ 5″ longitude W. from Paris, the other node at 59° 57′ 55″ E. of Paris. The points where the axis of the magnetic equator pierces the earth's surface are, the northern point at 79° 1′ 4″ N. lat. and 30° 2′ 5″ W. long. from Paris; the southern point is situated in the same latitude south, and 149° 57′ 55″ E. long. from Paris.

It would carry us far beyond our limits were we to attempt to sketch the various theories of terrestrial magnetism which have been proposed: we must, therefore, refer to Birch's History of the Royal Society, vol. iii. 131; Halley, in Phil. Trans. No. 148; Canton in Phil. Trans. vols. xlviii and li.; Cavalla's Magnetism, and Lorimer's Supplement to ditto; Montucla, Histoire des Mathematiques, vol. iv. 510; and Gregory's translation of Haüy's Natural Philosophy, vol. ii. 105—130.

Declination of a vertical plane, or wall, in dialling, is an arch of the horizon, comprehended either between the plane and the prime vertical circle, when it is counted from the east or west; or between the plane and the meridian, if it be accounted from the north or south.

DECLINATOR, or **Declinatory**, an instrument in dialling, by which the declination, inclination, and reclination of planes are determined. The construction of this instrument, as somewhat improved by Mr. Jones, is as follows: on a mahogany board ABIK, fig. 9, Pl. 56, is inserted a semicircular arch AGEB of ivory or box-wood, divided into two quadrants of 90° each, beginning from the middle G. On the centre C turns a vertical quadrant DFE, divided into 90°, beginning from the base E; on which is a moveable index CF, with a small hole at F for the sun's rays to pass through, and form a spot on a mark at C. The lower extremity of the quadrant at E is pointed, to mark the linear direction of the quadrant when applied to any other plane; as this quadrant takes off occasionally, and a plumb-line P hangs at the centre on C, for taking the inclinations and reclinations of planes. At H, on the plane of the board, is inserted a compass of points and degrees, with a magnetical needle turning on a pivot over it. The addition of the moveable quadrant index considerably extends the utility of the declinator, by rendering it convenient for taking equal altitudes of the sun, the sun's altitude, and bearing, at the same time, &c.

To apply this instrument in taking the declination of a wall or plane: place the side ACB in an horizontal direction to the plane proposed, and observe what degree or point of the compass the N part of the needle stands over from the north or the south, and it will be the declination of the plane from the north or south accordingly. In this case, allowance must be made for the variation of the needle (if any) at the place; and which, if not previously known, will render this operation very inaccurate. At London it is now 24° 9′ to the west.

Another way more exact may be used, when the sun shines out half an hour before noon. The side ACB being placed against the plane, the quadrant must be so moved on the semicircle AGB, and the index CF on DF, till the sun's rays passing through the hole at F fall exactly on the mark at G, and continued so till the sun requires the index to be raised no higher: you will then have the meridian or greatest altitude of the sun; and the angle contained between G and E will be the declination required. The position of CE is the meridian or 12 o'clock line. But the most exact way for taking the declination of a plane, or finding a meridian line, by this instrument, is, in the forenoon, about two or three hours before 12 o'clock, to observe two or three heights or altitudes EF of the sun; and at the same time the respective angular polar distances GE from G: write them down; and in the afternoon watch for the same, or one of the same altitudes, and mark the angular distances or distance on the quadrant AG: now, the division or degree exactly between the two noted angular distances will be the true meridian, and the distance at which it may fall from the C of the divisions at G will be the declination of the plane. The reason for observing two or three altitudes and angles in the morning is, that in case there should be clouds in the afternoon, you may have the chance of one corresponding altitude.

The quadrant occasionally takes off at C, in order to place it on the surface of a pedestal or plane intended for an horizontal dial; and thereby from equal altitudes of the sun, as above, draw a meridian or twelve o'clock line to set the dial by.

The base ABIK serves to take the inclination and reclination of planes. In this case, the quadrant is taken off, and the plummet P is fitted on a pin at the centre C: then the side IGK being applied to the plane proposed, as QL (fig. 10.) if the plumb-line cuts the semicircle in the point G, the plane is horizontal; or if it cut the quadrant in any point at S, then will GCS be the angle of inclination. Lastly, if applying the side ACB (fig. 10.) to the plane, the plummet cuts G, the plane is vertical, or if it cuts either of the quadrants, it is accordingly the angle of reclination. Hence, if the quantity of the angle of inclination be compared with the elevation of the pole and equator, it is easily known whether the plane be inclined or reclined.

To DECLI'NE, *v. n.* (*declino*, Lat.) 1. To lean downward (*Shakspeare*). 2. To deviate; to run into obliquities (*Exodus*). 3. To shun; to avoid to do any thing. 4. To sink; to be impaired; to decay (*Denham*).

To Decli'ne. *v. a.* 1. To bend downward; to bring down (*Spenser*). 2. To shun; to avoid; to refuse (*Clarendon*). 3. To modify a word by various terminations; to inflect (*Watts*).

Decli'ne. *s.* The state of tendency to the worse; diminution; decay (*Prior*).

DECLI'VITY. *s.* (*declivis*, Latin.) Inclination or obliquity reckoned downward; gradual descent; the contrary to acclivity (*Swift*).

DECLI'VOUS. *a.* (*declivis*, Latin.) Gradually descending; not precipitous.

To DECO'CT. *v. a.* (*decoquo, decoctum*, Lat.) 1. To prepare by boiling for any use; to digest in hot water (*Bacon*). 2. To digest by the heat of the stomach (*Davies*). 3. To boil in water (*Bacon*). 4. To boil up to a consistence (*Shakspeare*).

DECO'CTIBLE. *a.* (from *decoct.*) That may be boiled, or prepared by boiling.

DECO'CTION. *s.* (*decoctum*, Lat.) 1. The act of boiling any thing, to extract its virtues (*Bacon*).

Decoction. (*decoctum*, from *decoquo*, to boil.) In pharmacy, any medicine boiled in a watery fluid. In a chemical point of view it is a continued ebullition with water, to separate such parts of bodies as are only soluble at that degree of heat. The following are the chief preparations in modern dispensatories.

D. althææ. This preparation, directed in the Edinburgh Pharmacopœia, may be exhibited as a common drink in nephralgia, and many diseases of the urinary passages, with advantage.

D. chamæmeli. A very common and excellent vehicle for tonic powders, pills, &c. It is also in frequent use for fermentation and clysters.

D. cinchonæ. This way of administering the bark is very general, as all the other preparations may be mixed with it as necessity requires. It is a very proper fomentation for prolapsus of the uterus and rectum.

D. cornu cervi. *Decoctum album.* This preparation of hartshorn possesses absorbent and antacid qualities, and is a very excellent drink in fevers attended with diarrhœa, and acidities of the prima viæ.

D. Geoffrææ. This is by far the most proper form for administering this medicine, which possesses laxative, narcotic, and anthelmintic virtues.

D. guaiaci compositum. This possesses stimulant and diaphoretic qualities, and is generally exhibited in cutaneous diseases which are dependant on a vitiated state of the humours.

D. hellebori albi. The itch and some eruptions of the scalp are occasionally removed by this application, which should be used as a lotion.

D. hordei. Barley decoction is a very nutritive and softening drink, and the most proper of all liquors in inflammatory diseases. It is an excellent gargle in inflammatory sore throats, mixed with a little nitre.

D. hordei compositum. From the pectoral and demulcent qualities of this decoction, it may be administered as a common drink in catarrh, and several affections of the chest.

D. mezerei. An acrid and very stimulating decoction, sometimes exhibited in indolent glandular swellings.

D. pro enemate. A very excellent form for an emollient clyster. A variety of medicines may be added to answer particular indications.

D. pro fomento. This preparation possesses antiseptic properties, and may be directed with advantage in sphacelus.

D. sarsaparillæ. This is much extolled by some practitioners in phthisis, and serves to restore the strength after a long course of mercury.

D. sarsaparillæ compositum. The alterative property of this compound is very great: it is generally given after a course of mercury, where there has been nodes and indolent ulcerations, and with great benefit.

D. senekæ. The chief qualities of the seneka are contained in this form. An addition of a small quantity [illegible]quorice obviates an unpleasant sensation otherwise produced by it in the fauces.

D. ulmi. This may be employed, with great advantage, as a collyrium in chronic ophthalmia. It is given internally in some cutaneous eruptions.

DECO'CTURE. *s.* (from *decoct.*) A substance drawn by decoction.

DECOLLA'TION. *s.* (*decollatio*, Latin.) The act of beheading (*Brown*).

DECOMPO'SITE. *a.* (*decompositus*, Latin.) Compounded a second time (*Bacon*).

DECOMPOSITION, in chemistry, the disunion of substances already joined together; a change which is uniformly succeeded by the formation of new compounds. Few chemical processes take place without a decomposition of some kind; and hence decompositions are almost innumerable in their variety, and depend upon the nature of the chemical substances employed. See Analysis.

Decomposition of forces. See Parallelogram of forces.

To DECOMPO'UND. *v. a.* (*decompono*, Latin.) 1. To compose of things already compounded; to compound a second time (*Newton*). 2. To resolve a compound into simple parts.

Decompo'und. *a.* (from the verb.) Composed of things or words already compounded; compounded a second time (*Boyle*).

Decompound leaf. In botany, when the primary petiole is so divided that each part forms a compound leaf. The different kinds of the decompound leaf are Bigeminate, Biternate, and Bipinnate: which see in their proper places.

DE'CORAMENT. *s.* (from *decorate.*) Ornament; embellishment.

To DE'CORATE. *v. a.* (*decoro*, Lat.) To adorn; to embellish; to beautify.

DECORA'TION. *s.* (from *decorate.*) Ornament; added beauty (*Dryden*).

Decoration, in architecture, any thing that adorns and enriches a building, church, triumphal arch, or the like, either withoutside, or within. The orders of architecture contribute greatly to decoration; and paintings, vases, festoons, &c. are often very successfully applied.

Decoration is more particularly applied to the scenes of theatres. In operas, and other theatrical performances, the decorations must be frequently changed conformably to the subject. The ancients had two kinds of decorations for their theatres: the first, called *versatiles*, having three sides, or faces, which were turned successively to the spectators: the other called *ductiles*, showing a new decoration by drawing or sliding it before another. This latter sort is still used, and apparently with much greater success than among the ancients, who were obliged to draw a curtain whenever they made a change in the decoration; whereas on our stage the change is made in a moment, and almost without being perceived.

DECORA'TOR. *s.* (from *decorate.*) An adorner.

DECO'ROUS. *a.* (*decorus*, Lat.) Decent; suitable to a character; becoming (*Ray*).

To DECO'RTICATE. *v. a.* (*decortico*, Latin.) To divest of the bark or husk (*Arbuthnot*).

DECORTICA'TION. *s.* (from *decorticate.*). The act of stripping the bark or husk.

DECO'RUM. *s.* (Latin.) Decency; behaviour contrary to licentiousness; seemliness (*Wotton*).

Decorum, in architecture, is the suitableness of a building, and the several parts and ornaments thereof, to the station and occasion.

To DECO'Y. *v. a.* (from *koey*, Dutch, a cage.) To lure into a cage; to entrap (*L'Estrange*).

Deco'y. *s.* Allurement to mischief (*Berkley*.

Decoy, a canal, river, pond, or sheet of water, in a marshy situation, surrounded with reeds, and appropriated to the purpose of taking wild-ducks and teal. The management of it requires much art, and the decoy ducks much dextrous training. Wild fowl sleep for the most part during the day, and seek their food towards evening and through the night. Hence as soon as evening sets in the decoy *rises*, as it is termed, and the sport commences. The machinery consists of a great variety of pipes or tubes terminating in nets, which are called tube or funnel nets; reed-skreens, which are placed at certain intervals along every pipe, and prevent the decoy man or his dog from being seen, excepting when necessary, and over the whole is suspended a large net upon hoops, extending over the entire pond or decoy space, and open only at one end. Just before the decoy-ducks are ordered by the whistle of the decoy-man, whose sound they know and obey, to commence their alluring stratagems, a small quantity of hemp seeds is thrown over the skreens to tempt the wild-fowl to advance: the trained birds now begin their *piping*, the wild-fowl make their appearance, and pass slowly, but generally in considerable numbers, over the skreens, and become completely surrounded by the suspended net. If the wild-fowl be inactive, the dog receives a signal to paddle a little at a distance, and they are sure to advance in the hope of catching and devouring what they suppose to be small fishes rising to the surface of the water. The decoy-man now rises and makes his appearance at the opening of the net where the wild-fowl entered; they cannot therefore retreat in that direction, and the net effectually prevents them from ascending perpendicularly; they follow therefore the trained birds into the respective pipes, which become narrower and narrower by degrees, so that at last not more than one at a time can pass forwards: another man is secreted at the end of each pipe, who, after suffering the decoy to escape upon the land on which the funnel terminates, receives the rest one after another, and breaks their necks as he receives them: in doing which much dexterity seems to be required.

A decoy in some seasons is astonishingly lucrative: in 1795 the Tillingham decoy in Essex, at that time in the occupation of Mr. Mascall, netted, after every expence, eight hundred pounds sterling; and the only birds taken were ducks and mallards. In 1799 ten thousand heads of wigeons, teals, and wild-ducks were caught in a decoy of the Reverend Bate Dudley, in the same county. They are generally contracted for by the London poulterers, who formerly gave eighteen shillings per dozen (which, except in the case of duck and mallard, includes twenty-four, or the double dozen); though the price is now advanced to a guinea or five and twenty shillings.

Decoy-duck, a duck that lures others.

To DECRE'ASE. *v. a.* (*decresco*, Lat.) To grow less; to be diminished (*Newton*).

To Decre'ase. *v. n.* To make less; to diminish (*Daniel*).

Decre'ase. *s.* (from the verb.) 1. The state of growing less; decay (*Prior*). 2. The wain of the moon (*Bacon*).

Decreasing progression, one whose terms decrease by some regular rule, as the arithmetical progression 9, 7, 5, 3, 1, which decreases by the constant subtraction of the number 2. But the phrase is generally restrained to geometrical serieses, whose terms decrease in a regular proportion: as

for example 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, &c.

and again 1, $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$, $\frac{1}{81}$, $\frac{1}{243}$, $\frac{1}{729}$, &c.

In the first of these examples the sum of all the terms, *in infinitum*, is 2; the sum of the second progression, *in infinitum*, is 1½. What is here meant, and what ought to be understood in all such cases, is, that, whatever be the number of terms in any such progression, their amount can never equal the determined finite quantity called the *sum*, though it may approach to it in such a manner, that their difference will become smaller than any assignable quantity. The sum of any infinite geometrical series decreasing, is equal to the square of the first term divided by the difference between the first and second as is demonstrated by Malcolm in his Arithmetic. See Series.

To DECRE'E. *v. n.* (*decretum*, Latin.) To make an edict; to appoint by edict (*Milton*).

To Decre'e. *v. a.* To doom or assign by a decree (*Job*).

Decre'e. *s.* (*decretum*, Latin.) 1. An edict; a law (*Shakspeare*). 2 An established rule (*Job*). 3 A determination of a suit.

Decree, in the civil law, is a determination that the emperor pronounces upon hearing a particular cause between plaintiff and defendant.

Decree is a sentence pronounced by the lord chancellor in the court of chancery, and it is equally binding upon the parties, as a judgment in a court of law. By the laws of England, a decree (notwithstanding any contempts thereof) shall not bind the goods or moveables, but only charge the person. If a decree be obtained and enrolled, so that the cause cannot be reheard, then there is no remedy but by bill of review, which must be on error appearing on the face of the decree, or on matters subsequent thereto, as a release or a receipt discovered since.

Decrees of councils are the laws made by them, to regulate the doctrine and policy of the church.

DE'CREMENT. *s.* (*decrementum*, Latin.) Decrease; the state of growing less; the quantity lost by decreasing (*Brown*).

DECREMENTS, in mathematics, the small parts by which a variable and decreasing quantity becomes less and less.

DECRE'PIT. *a.* (*decrepitus*, Lat.) Wasted and worn out with age (*Addison*).

To DECRE'PITATE. *v. a.* (*decrepo*, Latin.) To calcine salt till it has ceased to crackle in the fire (*Brown*).

DECREPITA'TION. (*decrepitatio*, from *decrepo*, to crackle.) A kind of crackling noise, which takes place in bodies when heated: it is peculiar to some kinds of salt; which, from a state of solution, are crystallized so rapidly, that the crystals formed burst into minute pieces.

DECRE'PITNESS. Decrepi'tude. *s.* (from *decrepit*.) The last stage of decay; the last effects of old age (*Bentley*).

DECRE'SCENT. *a.* (from *decrescens*, Latin.) Growing less; being in a state of decrease.

DE'CRETAL. *a.* (*decretum*, Latin.) Appertaining to a decree; containing a decree (*Ayliffe*).

Decre'tal, in the canon law, a letter of a pope determining some point or question in the ecclesiastical law. The decretals composed the second part of the canon-law. The first genuine one acknowledged by all the learned as such, is a letter of pope Siricius, written in the year 385, to Himerus bishop of Tarragona in Spain, concerning some disorders which had crept into the churches of Spain. Gratian published a collection of decretals, containing all the ordinances made by the popes till the year 1150. Gregory IX. in 1227, following the example of Theodosius and Justinian, formed a constitution of his own; collecting into one body all the decisions, and all the causes, which served to advance the papal power: which collection of decretals was called the Pentateuch, becaused it contained five books.

DE'CRETIST. *s.* (from *decree*.) One that studies the decretal (*Ayliff*).

DE'CRETORY. *a.* (from *decree*.) 1. Judicial; definitive (*South*). 2. Critical; definitive (*Brown*).

DECRI'AL. *s.* (from *decry*.) Clamorous censure; hasty or noisy condemnation.

To DECRY'. *v. a.* (*decrier*, French.) To censure; to blame clamorously; to clamour against (*Dryden*).

DECUBITUS, in medicine, the manner or posture in which a sick person lies in bed. See Medicine.

DECUMARIA. In botany, a genus of the class dodecandria, order monogynia. Calyx ten-leaved, superior; petals ten; capsule eight or nine celled, many seeded. Two species, both natives of Carolina: one a climbing, and the other a creeping plant.

DECU'MBENCE. DECU'MBENCY. *s.* (*decumbo*, Latin.) The act of lying down; the posture of lying down (*Brown*).

DECUMBENT FLOWER. In botany. Decumbens flos. Having the stamens and pistils declined or bending down to the lower side of it; as in cassia. Stem: caulis decumbens, lying on the ground with the base higher than the other parts.

DECU'MBITURE. *s.* (from *decumbo*, Latin.) 1. The time at which a man takes to his bed in a disease. 2. (In astrology.) A scheme of the heavens erected for that time, by which the prognosticks of recovery or death are discovered.

DE'CUPLE. (*decuplus*, Latin.) Tenfold (*Ray*).

DECURIO, a subaltern officer in the Roman armies. He commanded a decuria, which consisted of ten men, and was the third part of a turma, or the 30th part of a legion of horse, which was composed of 380 men. There were certain magistrates in the provinces called *decuriones municipales*, who formed a body to represent the Roman senate in free and corporate towns. They consisted of ten; whence the name.

DECURRENT LEAF. Folium decurrens. In botany. A sessile leaf having its base extending downwards along the stem; as in symphytum, verbesina, carduus, sphæranthus. Applied also to the petiole, and the stipule.

DECU'RSION. *s.* (*decursus*, Latin.) The act of running down (*Hale*).

DECU'RSIVELY - PINNATE LEAF. Having the leaflets decurrent, or running along the petiole.

DECURTA'TION. *s.* (*decurtatio*, Latin.) The act of cutting short, or shortening.

DECURY, ten persons ranged under one chief, or leader.

To DECU'SSATE. *v. a.* (*decusso*, Latin.) To intersect at acute angles (*Ray*).

DECUSSATED LEAVES AND BRANCHES. Growing in pairs, which alternately cross each other at right angles; so that if the stem be viewed vertically, or the eye be directed right down it, the leaves or branches will appear to be in fours.

DECUSSATION, a term in geometry, optics, and anatomy, signifying the crossing of two lines, rays, or threads, when they meet in a point, and then go on separately from one another.

DEDDINGTON, a town in Oxfordshire, with a market on Tuesdays. Lat. 52. 2 N. Lon. 12. 1 W.

To DEDE'CORATE. *v. a.* (*dedecoro*, Lat.) To disgrace; to bring a reproach upon.

DEDECORA'TION. *s.* (from *dedecorate.*) The act of disgracing; disgrace.

DEDE'COROUS. *a.* (*dedecus*, Latin.) Disgraceful; reproachful; shameful.

DEDENTI'TION. *s.* (*de* and *dentitio*, Latin.) Loss or shedding of the teeth (*Brown*).

To DE'DICATE. *v. a.* (*dedico*, Latin.) 1. To devote to some divine power (*Numbers*). 2. To appropriate solemnly to any person or purpose (*Clarendon*). 3. To inscribe to a patron (*Peacham*).

DE'DICATE. *a.* (from the verb.) Consecrate; devote; dedicated; appropriate (*Spelman*).

DEDICATION, the act of consecrating a temple, altar, statue, palace, &c. to the honour of some deity. The use of dedications is very ancient, both among the worshippers of the true God, and among the heathens; the Hebrews call it חנכה *hhanuchah*, imitation; which the Greek translators render εγκαινια, and εγκαινισμος, renewing.

In the scripture we meet with dedications of the tabernacle, of altars, of the first and second temple, and even of the houses of private persons. There are also dedications of vessels, and garments of the priests and Levites, and even of the men themselves.

The heathens had also dedications of temples, altars, and images of their gods, &c. Nebuchadnezzar held a solemn dedication of his statue (*Dan.* iii. 2). Pilate dedicated gilt bucklers at Jerusalem to Tiberius (*Philo de legat*). Petronius would have dedicated a statue to the emperor in the same city (*ibid.* p. 791.) Tacitus (*Hist.* lib. iv. c. 53) mentions the dedication of the capitol, upon rebuilding it by Vespasian, &c.

The Christians finding themselves at liberty under Constantine, in lieu of their ruinous churches, built new ones in every place; and dedicated them with a deal of solemnity. The dedication was usually performed in a synod; at least they assembled a number of bishops to assist at the service. We have the description of those of the churches at Jerusalem and Tyre in Eusebius, and many others in later writers.

DEDICATION, in literature, is an address prefixed to a book, soliciting patronage, or testifying respect for the person to whom it is made. The dedication of the fourth part of Mr. Edwards's History of Birds is preserved here, not as one we think worthy of imitation, but on account of its singularity. It is this: "To GOD! the ONE eternal! the incomprehensible! the omnipresent! omniscient and Almighty Creator of all things that exist! from orbs immeasurably great, to the minutest points of matter, this ATOM is dedicated and devoted, with all possible gratitude, humiliation, and worship, and the highest adoration both of body and mind, by his most resigned, low, and humble creature, G. E."

DEDICA'TOR. *s.* (from *dedicate.*) One who inscribes his work to a patron with compliment and servility (*Pope*).

DE'DICATORY. *a.* (from *dedicate.*) Composing a dedication; adulatory (*Pope*).

DEDIMUS POTESTATEM, in law, a

commission granted to one or more persons, for the forwarding and dispatching some act appertaining to a judge, or some court; as to take answers in chancery, depositions of witnesses in a cause depending in that court, and levy a fine in the common pleas, &c. where persons live in the country or cannot travel.

DEDIDITII, among the Romans differed from CAPTIVES in this, that the latter were taken by force, whereas the former surrendered themselves.

DEDI'TION. *s.* (*deditio*, Latin.) The act of yielding up any thing; surrendry (*Hale*).

To DEDU'CE. *v. a.* (*deduco*, Latin.) 1. To draw in a regular connected series (*Pope*). 2. To form a regular chain of consequential propositions (*Locke*). 3. To lay down in regular order (*Thomson*).

DEDU'CEMENT. *s.* (from *deduce*.) The thing deduced; consequential proposition (*Dryden*).

DEDU'CIBLE. *a.* (from *deduce*.) Collectible by reason; consequential (*South*).

DEDU'CIVE. *a.* (from *deduce*.) Performing the act of deduction.

To DEDU'CT. *v. a.* (*deduco*, Latin.) 1. To subtract; to take away; to cut off; to defalcate (*Norris*). 2. To separate; to dispart: not in use (*Spenser*).

DEDU'CTION. *s.* (*deductio*, Latin.) 1. Consequential collection; consequence (*Dup.*). 2. That which is deducted, defalcation (*Pope*).

DEDU'CTIVE. *a.* (from *deduct.*) Deducible.

DEDU'CTIVELY. *ad.* Consequentially; by regular deduction (*Brown*).

DEDUTTIONE, the name given by Guido to the gradual rising of the voice, in solmization: the falling of the voice, he called *reduttione*.

DEE, a river which rises in the county of Merioneth, in two springs which unite near Pimble Meer into one stream. It passes through that lake, crosses Denbighshire, and separates that county from Cheshire, then runs into the Irish Sea, about 15 miles N.W. from Chester. The same name is given to two rivers in Scotland, and one in Ireland.

DEE (John), an English mathematician, born at London in 1527, and educated at St. John's college, Cambridge. On the founding of Trinity college he was chosen one of the fellows. Falling under the suspicion of magical practices, he went abroad, and took his degree of LL.D. at Louvain. He read lectures in the mathematics there, and at other universities, with great applause. In 1551 he returned to England, and obtained the rectory of Upton-upon-Severn. Soon after the accession of Mary to the throne he was taken up and committed to the Tower, on suspicion of treasonable practices; but after some time he was discharged. In 1570 he edited sir Henry Billingsley's translation of Euclid, to which he prefixed a preface, and added notes, which shew him to have been a deep mathematician. The year following he was at Louvain, where he fell very ill, and so highly was he esteemed by the queen, that she sent over two physicians to attend him. He returned as soon as he was recovered, and went to reside at Mortlake, where he collected a great library, which queen Elizabeth went to see in 1575. Her majesty also held frequent conversations with Dee upon philosophical subjects; but he seems to have received hardly any particular marks of her royal favour. In 1581 he and Edward Kelly began their magical operations, which lasted two years, in which they were joined by a Polish nobleman called Laski, who persuaded them to go to his castle. The confederates accordingly set out for Poland, where they remained some time. Their adventures abroad made so much noise that the queen thought proper to send for Dee home again, who accordingly returned in great pomp. In 1596 he was made warden of Manchester college, and died at Mortlake in 1608. Dee continued his magical studies to the last; and was sometimes very rudely treated by the common people as a conjuror. He published several mathematical works in Latin and English, and wrote many more which were never printed; but in 1659 Dr. Meric Casaubon published, a True and faithful Relation of what passed for many Years between Dr. John Dee and some Spirits, &c. out of the original copy written with Dr. Dee's own hand, kept in the library of sir Thomas Cotton, knt.

DEED. *s.* (ꝺæꝺ, Saxon.) 1. Action; thing done (*Smallridge*). 2. Exploit; performance (*Dryden*). 3. Power of action; agency (*Milton*). 4. Act declaratory of an opinion (*Hooker*). 5. Written evidence of any legal act (*Bacon*). 6. Fact; reality; the contrary to fiction (*Lee*).

DEED, an instrument written on paper or parchment, which relates principally to the conveyance or transferring of property, and the validity of which consists in the following essential particulars: 1. Proper parties to contract with one another, and a proper subject matter to be contracted for; 2. A good and sufficient consideration; 3. Writing on parchment, or paper, duly stamped; 4. Sufficient and legal words, properly disposed; 5. Reading (if it be desired) before execution; 6. By stat. 29 Car. II. c. 3, sealing, in many cases signing also; and, lastly, delivery, which must be done either by the party himself, or by his attorney, lawfully authorised, and expressed in the attestation. If any of these requisites be wanting, the deed is absolutely void, from the beginning.

DEED-POLL, is a deed polled, or shaved, quite even; in contradistinction from an indenture, which is cut unevenly, and answerable to another writing that comprehends the same words. A deed-poll is properly single, or of one part, and is intended for the use of feoffee, grantee, or lessee; an indenture always consists of two or more parts and parties. Every deed that is pleaded shall be intended to be a deed-poll, unless it is alleged to be indented.

DEE'DLESS. *a.* (from *deed*.) Unactive.

To DEEM. *v. n. particip. dempt* or *deemed.* (ꝺeman, Saxon.) To judge; to conclude upon consideration; to think; to opine (*Dryden*).

Deem. *s.* (from the verb.) Judgment; surmise; opinion: not in use (*Shakspeare*).

DEE'MSTER. *s.* (from *deem.*) A judge. This is the name given to the judges who decide all controversies in the Isle of Man.

DEEP. *a.* (ꝺeep, Saxon.) 1. Having length downward; profound (*Bacon*). 2. Low in situation; not high. 3. Measured from the surface downward (*Newton*). 4. Entering far; piercing a great way (*Shakspeare*). 5. Far from the outer part (*Dryden*). 6. Not superficial; not obvious (*Locke*). 7. Sagacious; penetrating (*Milton*). 8. Politick; insidious (*Shakspeare*). 9. Grave; solemn (*Shaksp.*). 10. Dark-coloured (*Dryden*). 11. Having a great deal of stillness, or gloom, or sadness (*Genesis*). 12. Depressed; sunk (*Corinthians*). 13. Bass; grave in sound (*Bacon*).

Deep. *s.* (from the adjective.) 1. The sea; the main; the ocean (*Waller*). 2. The most solemn or still part (*Shakspeare*).

Deep-sea line, or Dip-sea line, in the sea-language, a small line used for sounding, when a ship is in very deep water at sea.

At the end of this line is a piece of lead, called the deep sea lead, at the bottom of which is a coat of white tallow, to bring up stones, gravel, shells, or the like, from the bottom; in order to learn the differences of the ground; which being entered, from time to time, in the seamen's books, by comparing of observations, enable them to guess, by their soundings, &c. what coast they are on, though they cannot see land.

To DEE'PEN. *v. a.* (from *deep.*) 1. To make deep; to sink far below the surface (*Addison*). 2. To darken; to cloud; to make dark (*Peacham*). 3. To make sad or gloomy (*Pope*).

DEEPING, or Market-Deeping, a town of Lincolnshire, with a market on Thursdays. It is seated on the Welland, in a fenny country. Lat. 52. 42 N. Lon. 0. 21 W. Adjoining to this town are two villages, known by the names of *James Deeping* and *West Deeping*.

DEEP-MOUTHED. *a.* (*deep* and *mouth.*) Having a hoarse and loud noise (*Gay*).

Deep-musing. *a.* (*deep* and *muse.*) Contemplative; lost in thought (*Pope*).

DE'EPLY. *ad.* (from *deep.*) 1. To a great depth; far below the surface (*Tillotson*). 2. With great study or sagacity. 3. Sorrowfully; solemnly (*Donne*). 4. With a tendency to darkness of colour (*Boyle*). 5. In a high degree (*Bacon*).

DE'EPNESS. *s.* (from *deep.*) Entrance far below the surface; profundity; depth (*Knol.*).

DEER, in natural history, as a generic term, applies to the cervus tribe generally. (See Cervus.) Among foresters it is restrained to the individuals of this family that inhabit parks and forests; whose flesh is equally denominated venison, though very different in size, flavour, and estimation. Deer are of two descriptions; the one principally bred and preserved for the chase, the other for the table. For the first, see Red deer, Stag, and Hind; for the second Fallow deer, Buck, and Doe.

To DEFA'CE. *v. a.* (*defaire*, French.) To destroy; to rase; to ruin; to disfigure (*Prior*).

DEFA'CEMENT. *s.* (from *deface.*) Violation; injury; rasure; destruction (*Bacon*).

DEFA'CER. *s.* (from *deface.*) Destroyer; abolisher; violator (*Shakspeare*).

DE FACTO, something actually in fact, or existing; in contradistinction to de jure, where a thing is only so in justice, but not in fact: as a king de facto is a person that is in actual possession of a crown, but has no legal right to the same; and a king de jure is the person who has just right to the crown, though he is out of possession of it.

To DEFA'LCATE. *v. a.* (*defalquer*, Fr.) To cut off; to lop; to take away part.

DEFALCA'TION. *s.* (from *defalcate.*) Diminution; abatement (*Addison*).

To DEFA'LK. *v. a.* (See Defalcate.) To cut off; to lop away (*Decay of Piety*).

DEFAMA'TION. *s.* (from *defame.*) Calumny; reproach; censure; detraction (*Addison*).

Where any person circulates any report injurious to the credit or character of another, the party injured may bring an action to recover damages proportioned to the injury he has sustained; but it is incumbent upon the party to prove he sustained an injury, to entitle him to damages. In some cases, however, as for words spoken which by law are in themselves actionable, as calling a tradesman a bankrupt, cheat, or swindler, &c. there is no occasion to prove any particular damage; but the plaintiff must be particularly attentive to state words precisely as they were spoken, otherwise he will be nonsuited.

DEFA'MATORY. *a.* (from *defame.*) Calumnious; unjustly censorious; libellous (*Dryden*).

To DEFA'ME. *v. a.* (*de* and *fama*, Latin.) To make infamous; to censure falsely; to dishonour by reports; to calumniate (*Dryden*).

Defa'me. *s.* (from the verb.) Disgrace; dishonour: not in use (*Spenser*).

DEFA'MER. *s.* (from *defame.*) One that injures the reputation of another (*Government of the Tongue*).

To DEFA'TIGATE. *v. a.* (*defatigo*, Lat.) To weary; to tire (*Maine*).

DEFATIGA'TION. *s.* (*defatigatio*, Lat.) Weariness; fatigue.

DEFA'ULT. *s.* (*defaut*, French.) 1. Omission of that which we ought to do; neglect. 2. Crime; failure; fault (*Hayward*). 3. Defect; want (*Davies*). 4. (In law.) Non-appearance in court at a day assigned (*Cowell*).

Default, in hunting, or as it is commonly abbreviated, *fault*, a term implying that the hunted animal has escaped the sight and scent of the hounds; who, while throwing up their noses, as at a loss, and dashing in different directions in hope of recovery, are said to be *at a* *fault.* Different opinions have been formed as to the proper mode of proceeding at this period: whether to try forward, or to try backward: and here a great deal depends upon the game you are pursuing, and the country you are hunting in.

If, in pursuit of deer or fox, the hounds throw up on a fallow or highway, they cannot be got forward too soon, for certain it is that these have neither of them stopt in such places. Yet not so with the hare, who is likely to have thrown herself out by the side of the one, or squatted in a land (or furrow) of the other. Faults with the two former are much more easily and expeditiously hit off than with the latter, with whom they are sometimes almost incessant, particularly with a young or a hard-hunted hare. It should however be a fixed rule, never to abandon a fault, if possible, without recovery; it being, at least, as likely to bring the lost hare to a view as to find a fresh one.

DEFA′ULTER. *s.* One that makes default.

DEFE′ASANCE. *s.* (*defaisance*, French.) 1. The act of annulling or abrogating any contract or stipulation. 2. A condition annexed to an act, which performed by the obligee the act is disabled (*Cow.*). 3. The writing in which a defeasance is contained. 4. A defeat; conquest: obsolete (*Spenser*).

DEFE′ASIBLE. *a.* (from *defaire*, Fr.) That may be annulled (*Davies*).

DEFEAT. *s.* (from *defaire*, French.) 1. The overthrow of an army (*Addison*). 2. Act of destruction; deprivation (*Shakspeare*).

To DEFE′AT. *v. a.* 1. To overthrow; to undo (*Bacon*) 2. To frustrate (*Milton*). 3. To abolish; to undo; to change.

DEFE′ATURE. *s.* (from *de* and *feature.*) Change of feature; alteration of countenance: not in use (*Shakspeare*).

To DE′FECATE. *v. a.* (*defæco*, Latin.) 1. To purge; to purify; to cleanse (*Boyle*). 2. To purify from any extraneous or noxious mixture; to clear; to brighten (*Glanville*).

D′EFECATE. *a.* (from the verb.) Purged from lees or foulness (*Boyle*).

DEFECA′TION. *s.* (*defæcatio*, Lat.) Purification; the act of clearing (*Harvey*).

DEFE′CT. *s.* (*defectus*, Latin.) 1. Want; absence of something necessary; insufficiency; (*Davies*). 2. Failing; imperfection (*Shakspeare*). 3. A fault; mistake; errour (*Hooker*). 4. Any natural imperfection; a blemish (*Locke*).

To DEFE′CT. *v. n.* To be deficient (*Bro.*).

DEFECTIBI′LITY. *s.* (from *defectible.*) The state of failing; imperfection (*Hale*).

DEFE′CTIBLE. *a.* (from *defect.*) Imperfect; deficient; wanting (*Hale*).

DEFE′CTION. *s.* (*defectio*, Latin.) 1. Want; failure. 2. A falling away; apostacy (*Raleigh*). 3. An abandoning of a king, or a state; revolt (*Davies*).

DEFE′CTIVE. *a.* (from *defectivus*, Lat.) 1. Wanting the just quantity (*Brown*). 2. Full of defects; imperfect (*Addison*). 3 Faulty; vitious; blamable (*Addison*).

DEFE′CTIVE OR DEFICIENT NOUNS. (In grammar.) Indeclinable nouns, or such as want a number in some particular case.

DEFE′CTIVE VERB. (In grammar.) A verb which wants some of its tenses.

DEFE′CTIVENESS. *s.* (from *defective.*) Want; faultiness (*Addison*).

DEFE′NCE *s.* (*defensio*, Lat.) 1. Guard; protection; security (*Swift*). 2. Vindication; justification; apology (*Acts*). 3. Prohibition (*Temple*). 4. Resistance.

DEFENCE, in fortification, all sorts of work that cover and defend the opposite posts; as flanks, casements, parapets, and faussebrays.

DEFENCE (Line of), a supposed line drawn from the angle of the curtain, or from any other part in the curtain, to the flanked angle of the opposite bastion. See CURTAIN and BASTION.

A line of defence represents the flight of a musket-ball from the place where the musketeers stand, to scour the face of the bastion, and ought never to exceed the reach of a musket.

DEFENCE, in law, signifies a plea, or what the defendant ought to make after the plaintiff's count, or declaration, viz. that he defends all the wrong, force, and damages, where and when he ought, &c. If the defendant would plead to the jurisdiction, be must omit the words "where and when he ought;" and if he would shew any disability in the plaintiff, and demand judgment if the plaintiff shall be answered, then he ought to omit the defence of the damage. There is a full defence usually in personal actions.

To DEFE′NCE. *v. a.* (*defensus*, Latin.) To defend by fortification: not in use (*Fairfax*).

DEFENCES, in heraldry, the weapons of any beast, as the horns of a stag, the tusks of a wild boar, &c.

DEFE′NCELESS. *a.* (from *defence.*) 1. Naked; unarmed; unguarded (*Milton*). 2. Impotent; unable to make resistance (*Ad.*).

To DEFE′ND. *v. a.* (*defendo*, Lat.) 1. To stand in defence of; to protect; to support (*Shakspeare*). 2. To vindicate; to uphold; to assert; to maintain (*Swift*). 3. To fortify; to secure (*Dryden*). 4. To prohibit; to forbid (*Temple*). 5. To maintain a place, or cause, against those that attack it (*Smith*).

DEFEND, *defendere*, in our ancient laws and statutes, signifies to prohibit or forbid. See DEFENCE. (5 Richard II. cap. 7.) In which sense also Chaucer uses it, in the following passage:

> Where can you say in any manner, age,
> That ever God defended marriage.

See also Milton's Parad. Lost, book ii. line 86.

DEFE′NDABLE. *a.* (from *defend.*) That may be defended.

DEFE′NDANT. *a.* (from *defendo*, Lat.) Defensive; fit for defence (*Shakspeare*).

DEFE′NDANT. *s.* (from the adjective.) 1. He that defends against assailants (*Wilkins*). 2. (In law.) The person accused or sued (*Hudibras*).

DEFE'NDER. *s.* (from *defend.*) 1. One that defends; a champion (*Shakspeare*). 2. An assertor; a vindicator (*South*). 3. (In law.) An advocate.

Defender of the faith (*Fidei defensor*), a peculiar title belonging to the king of England; as Catholicus to the king of Spain. These titles were given by the popes of Rome. That of Fidei Defensor was first conferred by Leo X. on king Henry VIII. for writing against Martin Luther; and the bull for it bears date, quinto idus Oct. 1521. It was afterwards confirmed by Clement VII. But the pope, on Henry's suppressing the houses of religion at the time of the reformation, not only deprived him of his title, but deposed him from his crown also: though in the 35th year of his reign, his title, &c. was confirmed by parliament; and hath continued to be used by all succeeding kings to this day. Chamberlayne says, the title belonged to the kings of England before that time, and for proof of this appeals to several charters granted to the university of Oxford. So that pope Leo's bull was only a renovation of an ancient right.

DEFE'NSATIVE. *s.* (from *defence.*) 1. Guard; defence (*Brown*). 2. (In surgery.) A bandage, plaster, or the like, used to secure a wound.

DEFE'NSIBLE. *a.* (from *defence.*) 1. That may be defended (*Bacon*). 2. Justifiable; capable of vindication (*Collier*).

DEFE'NSIVE. *a.* (*defensif*, Fr.) 1. That serves to defend; proper for defence; not offensive (*Sidney*). 2. In a state or posture of defence (*Milton*).

Defe'nsive. *s.* (from the adjective.) 1. Safeguard (*Bacon*). 2. State of defence (*Clarendon*).

DEFE'NSIVELY. *ad.* In a defensive manner.

DEFE'NST. *part. pass.* (from *defence.*) Defended: obsolete (*Fairfax*).

To **DEFE'R.** *v. n.* (from *differo*, Latin.) 1. To put off; to delay to act (*Milt.*). 2. To pay deference to another's opinion.

To **Def'er.** *v. a.* 1. To withhold; to delay (*Pope*). 2. To refer to; to leave to another's judgment and determination (*Bacon*).

DE'FERENCE. *s.* (*deference*, French.) 1. Regard; respect (*Swift*). 2. Complaisance; condescension (*Locke*), 3. Submission (*Addison*).

DEFERENS VAS. (*deferens*; from *differo*, to convey; because it conveys the semen to the vesiculæ seminales.) In anatomy. See Vas deferens.

DE'FERENT. *a.* (from *deferens*, or *defero*, Latin.) That carries up and down (*Bacon*).

De'ferent. *s.* (from the adjective.) That which carries; that which conveys (*Bacon*).

Deferent, in the old astronomy, an imaginary circle, which, as it were, carries about the body of a planet, and is the same with the eccentric.

DEFI'ANCE. *s.* (from *deffi*, French.) 1. A challenge; an invitation to fight (*Dryden*). 2. A challenge to make any impeachment good. 3. Expression of abhorrence or contempt (*Locke*).

DEFI'CIENCE. Defi'ciency. *s.* (from *deficio*, Latin.) 1. Want; something less than is necessary (*Arbuthnot*). 2. Defect; failing; imperfection (*Spratt*).

DEFI'CIENT. *a.* (*deficiens*, Lat.) Failing; wanting; defective; imperfect (*Wotton*).

Deficient hyperbola, is a curve having only one asymptote, though two hyperbolic legs running out infinitely by the side of the asymptote, but contrary ways.

Deficient interval, in music, one less than the true by a comma.

Deficient numbers, those whose aliquot parts when added together, make sums less than the numbers themselves: as 8, whose parts 1, 2, and 4, make only 7.

DEFI'ER. *s.* (from *deffi*, French.) A challenger; a contemner (*Tillotson*).

To **DEFI'LE.** *v. n.* (aꝼılan, Saxon.) 1. To make foul or impure; to dirty (*Shakspeare*). 2. To pollute; to make legally or ritually impure (*Leviticus*). 3. To corrupt chastity; to violate (*Prior*). 4. To taint; to corrupt; to vitiate (*Wakefield*).

To **Defi'le.** *v. n.* (*deffiler*, Fr.) To march; to go off file by file.

Defi'le. *s.* (*defile*, Fr.) A narrow passage (*Addison*).

Defile, in fortification, a straight narrow passage, through which a company of horse or foot can pass only in file, by making a small front; so that the enemy may take an opportunity to stop their march, and to charge them with so much the more advantage, as those in the front and rear cannot reciprocally come to the relief of one another.

DEFI'LEMENT. *s.* (from *defile.*) The state of being defiled; pollution; corruption (*Milton*).

DEFI'LER. *s.* (from *defile.*) One that defiles; a corrupter; a violator (*Addison*).

DEFI'NABLE. *a.* (from *define.*) 1. Capable of definition (*Dryden*). 2. That may be ascertained (*Burnet*).

To **DEFI'NE.** *v. a.* (*definio*, Latin.) 1. To give the definition; to explain a thing by its qualities and circumstances (*Sidney*). 2. To circumscribe; to bound (*Newton*).

To **Defi'ne.** *v. n.* To determine; to decide; to decree (*Bacon*).

DEFI'NER. *s.* (from *define.*) One that defines a thing by its qualities (*Prior*).

DE'FINITE. *a.* (from *definitus*, Lat.) 1. Certain; limited; bounded (*Sidney*). 2. Exact; precise (*Shakspeare*).

Definite, in grammar, is applied to an article that has a precise determinate signification; such as the article *the* in English, *le* and *la* in French, &c. which fix and ascertain the noun they belong to, to some particular, as *the King*, *le Roy*; whereas in the quality *of King*, *de Roy*, the articles *of* and *de* mark nothing precise, and are therefore indefinite.

De'finite. *s.* (from the adjective.) Thing explained or defined (*Ayliffe*).

DEFINITIVENESS. *s.* (from *definite.*) Certainty; limitedness.

DEFINI'TION. *s.* (*definitio*, Latin.) 1. A short description of a thing by its properties (*Dryden*). 2. Decision; determination.

Definition, in logic, an enumeration of the chief simple ideas of which a compound idea consists; in order to ascertain or to explain its nature and character.

Definitions are of two kinds; the one nominal, or, of the name: the other real, or, of the thing.

Definition of the name, or nominal definition, is that which explains the sense or signification appropriated to a word: or, as Wolfius more accurately considers it, it is an enumeration of certain marks, or characters, sufficient to distinguish the thing defined from any other thing; so as to leave it out of doubt what the subject is that is intended, or denoted by the name. This is what is meant by definition in mathematics.

Such is the definition of a square, when it is said to be a quadrilateral, equilateral, rectangular figure.

By definition of the name, is either meant a declaration of the ideas and characters appropriated to the word in the common usage of the language; or the peculiar ideas, &c. which the speaker thinks fit to denote by that word, i. e. the special sense wherein he proposes to use it, in his future discourse. For it may be observed, that the significancy of any word depends entirely on our will; and we may affix what idea we please to a sound, which itself signifies nothing at all.

The definition of the name, therefore, in the second sense, is merely arbitrary, and ought never to be called in question; only it is to be minded, that we keep inviolably to the same signification. Hence, a definition comes to stand, or to be made use of, as an undoubted or self-evident maxim; as it frequently does, and particularly among geometricians, who, above all other people, make use of such definitions.

Definition of the thing, or real definition, is properly an enumeration of the principal attributes of a thing, in order to convey or explain its nature.

Thus, a circle is defined a figure, whose circumference is every where equidistant from its center.

Wolfius defines a real definition to be a distinct notion explaining the genesis of a thing; that is, the manner wherein the thing is made, or done: such is that of a circle, whereby it is said to be formed by the motion of a right line round a fixed point. On which footing, what was before instanced as a real definition of a circle amounts to no more than a nominal one.

This notion of a real definition is very strict and just; and affords a sufficient distinction between a real and a nominal one. But though it has the advantages of analogy, distinctness, and conveniency, on its side; yet, being only itself a nominal definition, i. e. a definition of the term *real definition*, we must consider it in that light, that is, an idea fixed arbitrarily to that word, and which the author always denotes by that word in the course of his book.

Of the parts enumerated in a definition, some are common to other things beside the thing defined; others are peculiar thereto: the first are called the genus, or kind; and the second, the difference. Thus, in the former definition of a circle, by a figure whose circumference is every where equidistant from its center; the word figure is the kind, as being a name common to all other figures, as well as the circle; the rest are the difference, which specify, or distinguish, this figure from every other figure. And hence arises that rule of F. de Colonia, for the making of a definition. "Take," says he, "something that is common to the thing defined with other things, and add to it something that is proper, or peculiar to the thing; i. e. join the genus and specific difference, and you will have a definition."

The special rules for a good definition are these: 1. A definition must be universal, or adequate, that is, it must agree to all the particular species, or individuals that are included under the same idea. 2. It must be proper, and peculiar to the thing defined, and agree to that alone. These two rules being observed, will always render a definition reciprocal with the thing defined, that is, the definition may be used in the place of the thing defined; or they may be mutually affirmed concerning each other. 3. A definition should be clear and plain; and, indeed, it is a general rule concerning the definition both of names and things, that no word should be used in either of them which has any difficulty in it, unless it has been before defined. 4. A definition should be short, so that it must have no tautology in it, nor any words superfluous. 5. Neither the thing defined, nor a mere synonymous name, should make any part of the definition.

DEFI'NITIVE. *a.* (*definitivus*, Lat.) Determinate; positive; express (*Wotton*).

DEFI'NITIVELY. *ad.* Positively; decisively; expressly (*Hall*).

DEFI'NITIVENESS. *s.* Decisiveness.

DEFLAGRABI'LITY. *s.* (from *deflagro*, Latin.) Combustibility (*Boyle*).

DEFLA'GRABLE. *a.* (from *deflagro*, Latin.) Having the quality of wasting away wholly in fire, without any remains (*Boyle*).

DEFLAGRA'TION. (*deflagratio*, from *deflagro*, to burn.) Calcination. A chemical term, chiefly employed to express the burning or setting fire to any substance; as nitre, sulphur, &c.

To **DEFLE'CT.** *v. n.* (*deflecto*, Latin.) To turn aside; to deviate from a true course (*Blackmore*).

DEFLECTED, in botany; a branch of a tree, bowed, or bending down archwise.

DEFLECTION, the turning any thing aside from its former course by some adventitious or external cause.

The word is often applied to the tendency of a ship from her true course, by reason of currents, &c. which divert her, and turn her out of her right way.

Deflection of the rays of light, is a property which Dr. Hook observed in 1674-5, and read an account of before the Royal Society, March 18, the same year. He says, he found it different both from reflection and refraction; and that it was made towards the surface of the opacous body perpendicularly.

This is the same property which sir Isaac Newton calls inflection. It is called by others diffraction.

DEFLECTIVE FORCES (from *deflecto*, Lat. to bend or turn aside), are those forces which act upon a moving body in a direction different from that of its actual course, in consequence of which the body is deflected, or turned, or drawn aside, from the direction in which it is moving. Such is the attractive force of the sun upon the earth in its orbit.

DEFLE'XURE. *s.* (from *deflecto*, Latin.) A bending down; a turning aside, or out of the way.

DEFLORATE, in botany. Having discharged the farina or pollen.

DEFLORATION, or **Deflowering**, the act of violating or taking away a woman's virginity. (See Virginity.) Death or marriage is decreed by the civil law in case of defloration.

To **DEFLO'UR.** *v. a.* (*deflorer*, French.) 1. To ravish; to take away a woman's virginity (*Ecclus.*). 2. To take away the beauty and grace of any thing (*Taylor*).

DEFLO'URER. *s.* (from *deflour.*) A ravisher; one that takes away virginity (*Ad.*).

DEFLU'OUS. *a.* (*defluus*, Latin.) 1. That flows down. 2. That falls off.

DEFLU'X. *s.* (*defluxus*, Latin.) Downward flow (*Bacon*).

DEFLUXION. (*defluxio*, from *defluo*, to run off.) In medicine, a discharge of a fluid from any part.

DE'FLY. *ad.* (from *deft.*) Dextrously; skilfully: properly deftly (*Spenser*).

DEFOE (Daniel), a celebrated English writer, was born, we believe, at Elton, in Huntingdonshire, in the year 1660. He was bred a hosier; which profession, however, he soon forsook, and became one of the most enterprising authors that any age has produced. When discontents ran high at the revolution, and king William was obliged to dismiss his Dutch guards, De Foe, who had true notions of civil liberty, ridiculed the enemies of government in his well-known poem, called The True-born Englishman, which had a prodigious sale. The next satire he wrote was entitled Reformation of Manners; aimed at some persons of high rank, who rendered themselves a disgrace to their country. When the ecclesiastics in power breathed too much of a spirit of persecution, De Foe wrote a trac called The Shortest Way with the Dissenters: for which he was called to account, and explained himself with great firmness. He was afterwards sentenced to the pillory for attacking some public measures; which so little intimidated him, that, in defiance of their usage, he wrote A Hymn to the Pillory. It would be endless to enumerate all his publications: but the following are the principal: The History of the Plague in 1665; a novel entitled The History of Colonel Jack; A new Voyage round the World by a Company of Merchants, printed for Betteswortlı, 1725; The History of Roxana; Memoirs of a Cavalier; The History of Moll Flanders; The Family Instructor; a book entitled Religious Courtship, which has undergone upwards of 30 editions; and the Life and Adventures of Robinson Crusoe; an admirable performance, of which there have been editions without number, but concerning which there is an anecdote that does the author of it no credit as to the better part of a writer's character, honesty. When captain Woods Rogers touched at the island of Juan Fernandes, in the South Sea, he brought away Alexander Selkirk, a Scots sailor, who had been left ashore there, and had lived on that desolate place above four years. When Selkirk came back to England, he wrote a narrative of his adventures, and put the papers into the hands of De Foe to digest for publication; who ungenerously converted the materials into the History of Robinson Crusoe, and returned Selkirk his papers again! a fraud for which, in a humane view, the distinguished merit of that romance can never atone. For the evidence on which this charge against De Foe stands, see Providence Displayed, or, An Account of the extraordinary Sufferings of Alexander Selkirk, by Mr. Isaac James, of Bristol. Daniel De Foe died at Islington, in 1731. All his productions of the romantic species, but especially the two last mentioned, are much in vogue among country readers; and, on account of their moral and religious tendency, may probably do a great deal of good. Robinson Crusoe is a performance strictly unique, both in the plan and execution. Our praises, however, must be confined to the first volome, which, probably, was all he intended publishing, till the second was drawn from him by motives of gain. De Foe also wrote a History of the Scotch Union, a work which does the author considerable credit: a new edition of it was published a few years ago, in 4to. by Chalmers.

DEFOEDA'TION. *s.* (from *defœdus*, Lat.) The act of making filthy; pollution (*Bent.*).

DEFOLIATION, or shedding the leaves. In botany, a term that implies not so much the action of unleaving, or shedding leaves; as the season in which this action is performed.

The following table, respecting the mean times in which the different trees shed their leaves, is founded upon observation:

Gooseberry-tree and bladder-sena,	Generally shed their leaves about	Oct. 1.
Walnut and ash		—— 15.
Almond-tree, horse-chesnut, and lime-tree,		—— 20.
Maple, hazel-nut, black poplar, and aspen-tree,		—— 25.
Birch, plane-tree, mountain osier, false acacia, pear, and apple-tree,		Nov. 1.
Vine, mulberry, fig, sumac, and angelica-trees,		—— 10.
Elm-tree and willow,		—— 15.
Apricot and elder-trees,		—— 20.

It deserves to be remarked, that an evergreen tree grafted upon a deciduous, determines the latter to retain its leaves. This observation is confirmed by repeated experiments, particularly by grafting the laurel, or cherry-bay, an evergreen, on the common cherry; and the ilex, or evergreen oak, on the oak.

DEFORCEMENT, in law, the casting any one out of his land, or a withholding of lands and tenements by force from the right owner.

DEFORCEMENT, in the law of Scotland, is used for resisting, or offering violence to the officers of the law, while they are actually employed in the exercise of their functions, by putting its orders and sentences in execution. The punishment of this crime is confiscation of moveables, joined with some arbitrary punishment, as fine, imprisonment, banishment, or corporal pains, according to the degree of violence, and other circumstances which aggravate the crime.

DEFORCEOR, in law, is a person that overcomes and casts forth another from his lands and tenements by force, and differs from a disseizor on this account: 1. That a man may be disseized without force. 2. A man may deforce another that never was in possession; as where many have a right to lands, as common heirs, and one of them enters and keeps out the rest. A deforceor likewise differs from an intruder, who is made by a wrongful entry only into land, &c. void of a possessor, whilst a deforceor is he that holds out against the right heir.

To DEFO'RM. *v. n.* (*deformo*, Latin.) 1. To disfigure; to make ugly (*Shakspeare*). 2. To dishonour; to make ungraceful (*Dryden*).

DEFO'RM. *a.* (*deformis*, Lat.) Ugly; disfigured; of an irregular form (*Milton*).

DEFORMA'TION. *s.* (*deformatio*, Lat.) A defacing; a disfiguring.

DEFO'RMEDLY. *ad.* (from *deform.*) In an ugly manner.

DEFO'RMEDNESS. *s.* (from *deformed.*) Ugliness; a disagreeable form.

DEFO'RMITY. *s.* (*deformitas*, Lat.) 1. Ugliness; illfavouredness (*Shakspeare*). 2. Ridiculousness (*Dryden*). 3. Irregularity; inordinateness (*K. Charles*).

DEFORMITY is immediately opposed to beauty, and denotes the want of that uniformity, symmetry, and variety, necessary to constitute beauty. Accordingly, Dr. Hutcheson defines it by the absence of beauty, or a deficiency in the beauty expected in any species. Deformity and beauty may be considered either as natural or moral. These are both referred by the above-mentioned ingenious writer to an internal sense, and our perceptions of them, as he supposes, arise from an original, arbitrary structure of our own minds, by which certain objects, when observed, are rendered the occasions of certain sensations and affections.

That many objects give no pleasure to our sense is obvious. Many are certainly void of beauty; but then, says this author, there is no form which seems necessarily disagreeable of itself, when we dread no other evil from it, and compare it with nothing better of the kind. Many objects are naturally displeasing, and distasteful to our external senses, as well as others pleasing, and agreeable; as smells, tastes, and some separate sounds: but with regard to our sense of beauty, no composition of objects which give not unpleasant simple ideas, seems positively unpleasant, or painful of itself, had we never observed any thing better of the same kind.

Had there been a species of the form which we now denominate ugly, or deformed, and had we never seen or expected greater beauty, we should have received no disgust from it; though the pleasure would not have been so great in this form as in those we now admire. Our sense of beauty seems designed to give us positive pleasure; but not positive pain, or disgust, any farther than what arises from disappointment.

The chief cause of the personal deformity so frequent at present, is the neglect of paying proper attention to the clothing of infants, by which they are deprived of the free use of their limbs; and thus, in a great measure, rendered unserviceable to society. But, though deformity may apparently be prejudicial to health, it is ultimately a real advantage. Deformed persons, it is true, possess a less share of strength than others; they should, therefore, be naturally more careful to preserve it, as well as their health; which can be effected only by a strict adherence to temperance. This object will likewise be considerably facilitated by moderate exercise, which few, in such a situation, can want strength to perform; and, as they are not calculated for violent exercise, they are consequently exempt from all the disorders arising from that source; and may thus attain a mature old age.

In the work entitled Fugitive Pieces is preserved an excellent essay on bodily deformity, by the late William Hay, esq. who was himself deformed, and who, while he rallies his own figure with great pleasantry, discusses the general subject in a manner equally instructive and agreeable. He considers the natural consequences of bodily deformity; how it affects the outward circumstances; and lastly, what turn it gives to the mind. The reader will find much amusement and information result from consulting this admirable essay.

DEFO'RSOR. *s.* (from *forceur*, French.) One that overcomes and casts out by force (*Blount*).

DEFOSSION, burying alive: this was inflicted by the Romans on vestal virgins guilty of incontinency.

To **DEFRA'UD.** *v. a.* (*defraudo*, Latin.) To rob or deprive by wile or trick; to cheat (*Pope*).

DEFRAUDATION. *s.* (*defraudo*, Lat.) Privation by fraud (*Brown*).

DEFRA'UDER. *s.* (from *defraud.*) A deceiver; one that cheats (*Blackmore*).

To **DEFRA'Y.** *v. a.* (*defrayer*, Fr.) To bear the charges of (*Bacon*).

DEFRA'YER. *s.* (from *defray.*) One that discharges expences.

DEFRA'YMENT. *s.* (from *defray.*) The payment of expences.

DEFT. *a.* (ðœft, Saxon.) Obsolete. 1. Neat; handsome; spruce. 2. Proper; fitting (*Shakspeare*). 3. Ready; dexterous (*Dry.*).

DEFTERDAR, or **Deftardar**, in the Turkish and Persian polity, an officer of state, answering to our lord treasurer, who appoints deputies in every province.

DE'FTLY. *ad.* (from *deft.*) Obsolete. 1. Neatly; dexterously (*Shakspeare*). 2. In a skilful manner (*Gay*).

DEFU'NCT. *a.* (*defunctus*, Lat.) Dead; deceased (*Hudibras*).

Defu'nct. *s.* (from the adjective.) One that is deceased; a dead man or woman (*Graunt*).

DEFU'NCTION. *s.* (from *defunct.*) Death (*Shakspeare*).

To **DEFY'.** *v. a.* (*deffier*, French.) 1. To call to combat; to challenge (*Dryden*). 2. To treat with contempt; to slight (*Shak.*).

Defy'. *s.* (from the verb.) A challenge; an invitation to fight (*Dryden*).

DEFY'ER. *s.* (from *defy.*) A challenger: more properly *defier* (*South*).

DEGE'NERACY. *s.* (from *degeneratio*, Latin.) 1. Departure from the virtue of our ancestors. 2. Desertion of that which is good (*Tillotson*). 3. Meanness (*Addison*).

To **DEGE'NERATE.** *v. n.* (*degenerer*, French.) 1. To fall from the virtue of our ancestors. 2. To fall from a more noble to a base state (*Tillotson*). 3. To fall from its kind; to grow wild or base (*Bacon*).

Dege'nerate. *a.* (from the verb.) 1. Unlike his ancestors (*Swift*). 2. Unworthy; base (*Milton*).

DEGE'NERATENESS. *s.* Degeneracy; state of being grown wild, or out of kind.

DEGENERA'TION. *s.* (from *degenerate.*) 1. A deviation from the virtue of one's ancestors. 2. A falling from a more excellent state to one of less worth. 3. The thing changed from its primitive state (*Brown*).

DEGE'NEROUS. *a.* (from *degener*, Lat.) 1. Degenerated; fallen from virtue. 2. Vile; base; infamous; unworthy (*South*).

DEGE'NEROUSLY. *ad.* In a degenerate manner; basely; meanly (*Decay of Piety*).

DEGLUTI'TION. *s.* (*deglutition*, Fr.) The act or power of swallowing (*Arbuthnot*). Deglutition is performed in the first place by means of the tongue, driving the aliment into the œsophagus or gullet, and then, by the contraction of the sphincter, and the fleshy fibres of the œsophagus, which, lessening its aperture, protrude the contents downward into the stomach.

DEGRADA'TION. *s.* (*degradation*, Fr.) 1. Dismission from an office or dignity (*Ayliffe*). 2. Degeneracy; baseness (*South*). 3. Diminution of value.

Degradation, a punishment of delinquent ecclesiastics. The canon-law distinguishes it into two sorts: the one summary, by word only; the other solemn, by stripping the person degraded of those ornaments and rights which are the ensigns of his order or degree. The canonists likewise distinguish degradation from deposition; understanding by the latter the depriving a man of his clerical orders, but by the former only the removing him from his rank or degree. In the ancient primitive church, degrading a clergyman was reducing him to the state and communion of laymen. The full import of the phrase, however, is the depriving him of his orders, and reducing him to the simple condition of a layman; a punishment inflicted for several offences, as adultery, theft, or fraud: and clergymen thus reduced were seldom allowed to recover their ancient station, except upon some great necessity or very pressing reason.

To **DEGRA'DE.** *v. a.* (*degrader*, French.) 1. To put one down from his degree (*Shakspeare*). 2. To lessen; to diminish the value of (*Milton*).

DEGREE'. *s.* (*degré*, French.) 1. Quality, rank; station (*Prior*). 2. The comparative state and condition in which a thing is (*Bac.*). 3. A step or preparation to any thing (*Sidn.*). 4. Order of lineage; descent of family (*Dryden*). 5. Order or class (*Locke*). 6. Measure; proportion (*Dryden*). 7. The vehemence or slackness of the hot or cold quality (*South*).

Degree, in algebra, a term applied to equations, to distinguish the highest power of the unknown quantity. Thus, if the index of that power be 3 or 4, the equation is respectively of the 3d or 4th degree.

Degree, in geometry or trigonometry, is the 360th part of the circumference of any circle. Every circle being considered as divided into 360 parts, called degrees; which are marked by a small ° near the top of the figure; thus 45° is 45 degrees.

The degree is subdivided into 60 smaller parts, called minutes, meaning first minutes; the minute into 60 others, called seconds; the second into 60 thirds; &c. Thus 45° 12′ 20″ are 45 degrees, 12 minutes, 20 seconds.

The magnitude or quantity of angles is accounted in degrees; for because of the uniform curvature of a circle in all its parts, equal angles at the centre are subtended by equal arcs, and by similar arcs in peripheries of different diameters; and an angle is said to be of so many degrees, as are contained in the arc of any circle comprehended between the legs of the angle, and having the angular point for its centre. Thus we say an angle of 90°, or of 45° 24′. It is also usual to say, such a star is elevated so many degrees above the horizon, or declines so many degrees from the equator; or such a town is situate so many degrees of latitude or longitude. A sign of the ecliptic or zodiac contains 30 degrees.

Degree of latitude, is the space or distance on the meridian through which an observer must move, to vary his latitude by one degree, or to increase or diminish the distance of a star from the zenith by one degree; and which, on the supposition of the perfect sphericity of the earth, is the 360th part of the meridian.

The quantity of a degree of a meridian, or other great circle, on the surface of the earth, is variously determined by different observers: and the methods made use of are also various.

Eratosthenes, 250 years before Christ, first determined the magnitude of a degree of the meridian, between Alexandria and Syene on the borders of Ethiopia, by measuring the distance between those places, and comparing it with the difference of a star's zenith distances at those places; and found it to be 694$\frac{4}{9}$ stadia.

Ptolemy fixes the degree at 68⅔ Arabic miles, counting 7½ stadia to a mile. The Arabs themselves, who made a computation of the diameter of the earth, by measuring the distance of two places under the same meridian, in the plains of Sennar, by order of Almamon, make it only 56 miles. Kepler, determining the diameter of the earth by the distance of two mountains, makes a degree 13 German miles; but his method is far from being accurate. Snell, seeking the diameter of the earth from the distance between two parallels of the equator, finds the quantity of a degree,

by one method 57064 Paris toises, or 342384 ft.;
by another meth. 57057 .... toises, or 342342 ft.

Since the time of Snell, a degree of latitude has been measured in different places, by various mathematicians: as our limits will not allow of our indulging in a complete historical detail, we shall present our readers with a comparative table of results, and then subjoin a few remarks and references.

TABULAR COMPARISON OF OBSERVATIONS.

Length of a Degree on the Level of the Sea.

Latitude.	Toises.	Fathoms according to Roy.	Measurers.
49° 20′¼ N.	57070		Fernelius, 1525.
52° 4′	57057		Snellius, 1620.
52° 46′	57419		Norwood, published 1636.
66° 20′	57422	61194·3	Maupertuis, 1736-7.
66° 21′ 12″	57209·28		Melanderhielm and Svanberg, 1802.
50° 41′	....	60840	Roy, 1790. The degree perpendicular to the meridian 61182·3 fathoms. Phil. Trans. 1795.
50° 9′ 27″	....	60826·6	
49° 23′	57074		Maupertuis and Cassini, 1739-40.
49° 7′	57064·5		Picart, 1669.
49° 3′	....	60833·0	Mean of Maupertuis, and Cassini, and Liesganig.
48° 43′		60839·4	
47° 40′	57091		Liesganig, 1768.
45° 0′	57028	60777·6	Cassini, 1739-40.
44° 44′	57069	60821·3	Beccaria, 1768.
43° 52′		60773.4	Mean of Beccaria and Boscovich.
43° 0′	56979	60725.5	Boscovich and Lemaire, 1752.
39° 12′	56888·4	60628.5	Mason and Dixon, 1764-8.
12° 32′		60494	Lambton, 1803.
0° 0′	56750	60485·5	Bouguer and Condamine, 1736-43.
38° 13′ S.	57037		Klostermann, 1789.
	56746		La Caille, 1752.
In Egypt	56880		Nouet. Phil. Mag. xii. 208.
44° 52′½ N.		60516·7	Biot and Arrago, 1808.
51° 13′		60884·	Mudge, 1800-2.
51° 9′		60825·	Do.
52° 2′ 20″		60820·	Do.
51° 35′ 18″		60864·	Do.
The measures indicated as great irregularities as those of colonel Mudge.			Mechain and Delambre 1790-1805.

From a comparison of the measures of a degree on the meridian, at different parts of the earth, it follows that the earth is not strictly spherical, but more nearly agrees in figure with an oblate spheroid; or, in the opinion of some, the segments of two rather unequal spheroids are united at the equator. See Earth and Ellipticity.

The great trigonometrical survey of this kingdom, originated principally from a memorial of M. Cassini de Thury, transmitted by the French ambassador to Mr. Fox, then (1783) secretary of state, setting forth what astronomy would derive from constructing a series of triangles that should connect trigonometrically the two observatories of Greenwich and Paris, and thus determine their relative positions, more accurately than it was supposed could be done by astronomical observations. Both nations at that time enjoyed the blessings of peace; and the scientific men of each country readily obtained from their respective governments the assistance and patronage which such an undertaking required. As the work proceeded, the objects and intentions of the philosophers on both sides of the water gradually expanded; and under the successive superintendance of Roy, Williams, and Mudge, in England; and Cassini, Mechain, Legendre, and Delambre in France; the operations have been conducted with remarkable accuracy, skill, and success.

The occasion of the recent measurement of the degree in Lapland was simply this. It had long been supposed that some errors had been made in the admeasurement in Lapland conducted by MM. Maupertuis, Clairaut, Camus, Lethonnier, and the Abbe Outhier, and the French National Institute wished for a new opportunity of examining into its accuracy: Bonaparte, therefore, at the suggestion of the Institute, wrote a letter personally to the king of Sweden, requesting permission for some members of that body to visit Lapland, in order to determine an arc of the meridian. That high-spirited young monarch replied, that he would consult the Academy of Sciences at Stockholm, whether such an operation was desirable for the interests of science; and if they were of this opinion, he would appoint Swedish mathematicians to undertake it. In consequence of this, Messrs. Svanberg, Ofverboom, Holinquist, and Palander, were appointed, and in 1801, 1802, 1803, went through the work with such assiduity, talent, and success, as reflect much honour on themselves, and on the country to which they belong. Their result differs more than 200 toises from that of Maupertuis; and M. Svanberg accounts for this difference from the circumstance of the French mathematicians having neglected to allow for variation from the level of the sea. From the whole, M. Svanberg now deduces, as the most probable conclusion, $\frac{1}{321\cdot068}$ for the ellipticity, and 3963·26 English miles, for the radius of our earth at the equator. See EARTH.

Those who wish to acquaint themselves with the best and most approved methods of conducting these extensive measurements will do well to consult colonel Mudge's various papers on the Grand Trigonometrical Survey; Base du Système métrique décimal, ou Mesure de l'arc du méridien compris entre le parallèles de Dunkerque et Barcelone, par M. Delambre. Exposition des Opérations faites en Laponie, &c. par M. Svanberg, Stockholm, 1805. Traité de Géodésie, par M. Puissaint. A very complete list of papers on this subject is given in the 2d volume of Dr. T. Young's Philosophy.

On the supposition that the earth's figure is that of an oblate spheriod, it has been shewn, 1. That a degree of the earth's equator is the first of two mean proportionals, between the last and first degrees of latitude. 2. If the diameter of the equator be to the axis of the earth, as 180 to 179, the latitude in which the degree of latitude will be equal to a degree of the equator will be 54° 48′ 24″. If the proportion be 230 to 229, the latitude comes out 54° 45′ 31″. 3. If the proportion be 180 to 179, the latitude, where the degree of the meridian will be equal to a degree of a circle, whose diameter is equal to the axis of the earth, will be found to be 35° 20′ 30″; assuming the proportion of 230 to 229, the latitude will be 35° 19′ 25″. (Horsley's Tracts, p. 394. &c.).

The lengths of the degrees on the meridian of an ellipsoid, increase from the equator to the pole very nearly as the square of the sine of the latitude. And the length of the degree at any point, is to the length at the equator, accurately as the cube of a line drawn parallel to the plumb line from a point in the axis equidistant from the centre with the equator, and terminating in a point of the plane of the equator, to the cube of the line drawn from this point to the true pole. Or, if e be the ellipticity, and x the sine of the latitude, the length of the degree will vary as $(1+(2e+ee)xx)^{\frac{3}{2}}$.

DEGREE OF LONGITUDE, is the space between two meridians that make an angle of 1° with each other at the poles; the quantity or length of which is variable, according to the latitude, being every where as the cosine of the latitude; viz as the cosine of one lat. is to the cosine of another, so is the length of a degree in the former lat. to that in the latter, on the supposition that the earth is spherical. But taking the earth as a spheroid, the degree of longitude may be found in any given latitude L, by saying, 1. As the equatorial diameter, to the polar, so is, tang. $\overline{90°-L}$, to tang. of an angle A: then 2. As radius, to sine of A, so is the length of a degree of the equator to the length of a degree on the parallel of the given latitude.

DEGREE IN MUSIC. The difference of position or elevation between any two notes. There are conjunct and disjunct degrees. When two notes are so situated as to form the interval of a second, the degree is said to be conjunct; and when they form a third, or any greater interval, the degree is called disjunct.

According to others, degrees are the little intervals, whereof the concords or harmonic intervals are composed: they are, the greater tone, the less tone, and the semitone. The latter sense of the term is used by ancient authors; the former by the moderns.

DEGREES OF COMPARISON, in grammar, are usually reckoned three, viz. positive, comparative, and superlative. See GRAMMAR.

DEGREE, in universities, denotes a quality conferred on the students or members, as a testimony of their proficiency in the different branches of learning, and entitling them to certain privileges. (See BACHELOR, &c.) At Cambridge, a person must have resided during the greater part of twelve several terms, before he can become a bachelor of arts. If a person of the age of 24 years is admitted of any college, he may take the degree of bachelor of divinity after ten years: but he need not reside more than three terms. A bachelor of laws must be of six years standing complete. A bachelor of physic is usually admitted in the course of his sixth year. A master of arts must have been a bachelor of arts at least three years. After he has been a master of arts seven years, he may become a bachelor of divinity. After he has been B.D. five years he may become doctor of divinity; or he may take the degree of D.D. per saltum if he be an M.A. of 12 years standing. After a person has been L.L.B. five years, or M.A. seven years, he may take the degree of Doctor of Laws. A bachelor of physic of five years standing, or seven years M.A. may become a Doctor of Physic. The following are entitled to honorary degrees: privy counsellors, bishops, dukes, marquisses, earls, viscounts, barons, sons of noblemen, persons related to the king, baronets, and knights, are entitled to the degree of M.A. only; the others to superior ones. For the exercises, ceremonies, fees, &c. on admission to these several degrees at Cambridge, we refer to Wall's

Account of the Ceremonies in the Senate House.

At Oxford, matters of this kind are on nearly the same footing: though the expences are, we believe, heavier; the expences of a degree of doctor in any of the faculties, in treats and set fees, usually amount to 100*l.*; and those of a master of arts to 20*l.* or 30*l.*

No person can take a degree in either of the English universities (a degree in music excepted) without declaring *bona fide* his assent and consent to every thing contained in the Book of Common Prayer and Thirty-nine Articles. On this account it is usual for those who are liberally educated among the dissenters, to study at one of the Scotch universities; but commonly at Edinburgh, Aberdeen, or Glasgow; and on this account probably it is, that many of the students at the English universities affect to speak with great contempt of degrees obtained in Scotland. The fact is, that in both countries the universities often receive as well as bestow honours by the conferring of degrees: and it is equally true, that while in one country degrees can be obtained by men equally ignorant of literature and of science, by mere residence; in one university of the other country, the Brodums and the Solomons can procure degrees by purchase, without any examination or test of talent. So that, though no person can question the right of the universities on both sides of the Tweed to grant degrees and academic honours; no person can deny that both in England and Scotland the right may sometimes be abused, by conferring those distinctions upon ignorance, which were originally intended for men of real talents and extensive attainments.

DEGREES, upon mathematical and philosophical instruments, are the divisions by which the changes in the things to which the instruments are applied are indicated. In this sense we speak of the degrees on a thermometer, &c.

By DEGRE'ES. *ad.* Gradually; by little and little (*Newton*).

DEGUSTA'TION. *s.* (*degustatio*, Latin.) A tasting.

DEHISCENT, in botany, the gaping or opening of capsules; it is also put for the season in which this usually happens.

DEHLI, a province of Mogulstan, in Asia, having Junjapore and Bengal on the N. Jamba on the N.E. Bacar on the E. Agra on the S. and Ajmir on the W.

DEHLI, the principal town of the above province; it is about ten miles in circumference, and was the residence of the great Mogul when Kouli Khan invaded Industan. The Mogul and his great officers of state were made prisoners in their city, and the conquerors compelled them to deliver up all their riches; but not being satisfied with this, he put several of the great men to the rack. It is surrounded with a brick wall, and defended by a fortress. It is 100 miles N. of Agra. Lat. 28. 20 N. Lon. 78. 15 E.

To DEHO'RT. *v. a.* (*dehortor*, Lat.) To dissuade; to advise to the contrary (*Ward*).

DEHORTA'TION. *s.* (from *dehortor*, Lat.) Dissuasion; a counselling to the contrary; advice against something (*Ward*).

DEHO'RTATORY. *a.* (from *dehortor*, Lat.) Belonging to dissuasion.

DEHO'RTER. *s.* (from *dehort.*) A dissuader; an adviser to the contrary.

DE'ICIDE. *s.* (from *deus* and *cædo*, Lat.) Death of our blessed Saviour (*Prior*).

To DEJE'CT. *v. a.* (*dejicio*, Latin.) 1. To cast down; to afflict; to grieve (*Shakspeare*). 2. To make to look sad (*Dryden*).

DEJE'CT. *a.* (*dejectus*, Latin.) Cast down; afflicted; low-spirited.

DEJE'CTEDLY. *ad.* (from *deject.*) In a dejected manner; sadly; heavily (*Bacon*).

DEJE'CTEDNESS. *s.* Lowness of spirits.

DEJE'CTION. *s.* (*dejectio*, Lat.) 1. Lowness of spirits; melancholy (*Rogers*). 2. Weakness; inability (*Arbuthnot*). 3. A stool (*Ray*).

DEJECTION, in astrology, is applied to a planet when in a sign opposite to that wherein it is of greatest influence. See EXALTATION.

DEJE'CTURE. *s.* (from *deject.*) The excrement (*Arbuthnot*).

DEJERA'TION. *s.* (from *dejero*, Lat.) A taking of a solemn oath.

DEIFICA'TION. *s.* (*deification*, French.) The act of deifying, or making a god.

DEIFICATION, in the pagan theology, the act or ceremony of deifying their emperors, i. e. of placing them among the gods, and decreeing divine honours to be rendered them. See GOD and CONSECRATION.

The deification is the same with apotheosis.

DE'IFORM. *a.* (from *deus* and *forma*, Lat.) Of a godlike form.

To DE'IFY. *v. a.* (*deifier*, French.) 1. To make a god of; to adore as god (*South*). 2. To praise excessively (*Bacon*).

To DEIGN. *v. n.* (from *daigner*, Fr.) To vouchsafe; to think worthy (*Milton*).

To DEIGN. *v. a.* To grant; to permit (*Shakspeare*).

To DEI'NTEGRATE. *v. a.* (from *de* and *integro*, Latin.) To diminish.

DEI'PAROUS. *a.* (*deiparus*, Latin.) That brings forth a god; the epithet applied to the blessed Virgin.

DEISM, the doctrine or belief of the deists. Deism, from Θεος, God, may properly be used to denote natural religion, as comprehending those truths which have a real foundation in reason and nature; and in this sense it is so far from being opposite to Christianity, that it is one great design of the gospel to illustrate and enforce it. Thus some of the deistical writers have affected to use it. But deism more precisely signifies that system of religion, relating both to doctrine and practice, which every man is to discover for himself by the mere force of natural reason, independent of all revelation, and exclusive of it; and this religion Dr. Tindal and others pretend is so perfect, as to be incapable of receiving any addition or improvement even from divine revelation.

DEISTS, a class of people known also under the denomination of Free-thinkers. The deists hold, that, considering the multiplicity of religions, the numerous pretences to revelation, and the precarious arguments generally advanced in proof thereof, the best and surest way is to return to the simplicity of nature and the belief of one God; which is the only truth agreed to by all nations. They complain, that the freedom of thinking and reasoning is oppressed under the yoke of religion; and that the minds of men are ridden and tyrannized by the necessity imposed on them of believing inconceivable mysteries; and contend that nothing should be required to be assented to, or believed, but what their reason clearly conceives.

Dr. Clarke distinguishes four sorts of deists. 1. Those who profess to believe the existence of an eternal, infinite, independent, intelligent Being, who made the world, without concerning himself in the government of it. 2. Those who believe the being and natural providence of God, but deny the difference of actions as morally good or evil, resolving it into the arbitrary constitution of human laws; and therefore they suppose that God takes no notice of them. With respect to both these classes, he observes, that their opinions can consistently terminate in nothing but downright atheism. 3. Those who, having right apprehensions concerning the nature, attributes, and all-governing providence of God, seem also to have some notion of his moral perfections; though they consider them as transcendent, and such in nature and degree, that we can form no true judgment, nor argue with any certainty concerning them; but they deny the immortality of human souls; alleging that men perish at death, and that the present life is the whole of human existence. 4. Those who believe the existence, perfections, and providence of God, the obligations of natural religion, and a state of future retribution, on the evidence of the light of nature, without a divine revelation: such as these, he says, are the only true deists; but their principles, he apprehends, should lead them to embrace Christianity; and therefore he concludes that there is now no consistent scheme of deism in the world.

The first deistical writer of any note that appeared in this country was Herbert baron of Cherbury. He lived and wrote in the last century. His book, De Veritate, was first published at Paris in 1624. This, together with his book De Causis Errorum, and his treatise De Religione Laici, were afterwards published in London. His celebrated work De Religione Gentilium was published at Amsterdam in 1663, in 4to. and in 1700, in 8vo.; and an English translation of it was published at London in 1705. As he was one of the first that formed deism into a system, and asserted the sufficiency, universality, and absolute perfection of natural religion, with a view to discard all extraordinary revelation, as useless and needless, we shall subjoin the five fundamental articles of this universal religion. They are these: 1. That there is one supreme God. 2. That he is chiefly to be worshipped. 3. That piety and virtue are the principal part of his worship. 4. That we must repent of our sins; and if we do so, God will pardon them. 5. That there are rewards for good men, and punishments for bad men, both here and hereafter. The positions of this and many other deists have been examined with much ability by Dr. Leland, in his View of the Deistical Writers. But we are not sure that we need refer even our hesitating readers to this work, satisfactory as most of its arguments are. Many of the deistical writers would have been forgotten long before this, had they not been kept alive by Leland's book. We have always thought the preserving vipers in spirits a disgusting practice; and we are besides convinced that every correct reasoner, whose turn of mind is not biassed by previous indulgence in vice, on comparing the difficulties and supports of the purest deism (that of Herbert) with those of Christianity, will find abundant reason to prefer the latter, and to say in the language of Scripture, "Their rock is not as our rock, our enemies themselves being judges."

DE'ISTICAL. *a.* (from *deist.*) Belonging to the heresy of the deists (*Watts*).

DE'ITY. *s.* (*deité*, French.) 1. Divinity; the nature and essence of God (*Hooker*). 2. A fabulous god (*Shakspeare*). 3. The supposed divinity of a heathen god (*Spenser*).

DEKHER (John), a learned jesuit, and chancellor of the university of Gratz, in Stiria, where he died in 1619, aged 69. He wrote, 1. Velificatio, seu theoremata de anno ortus ac mortis Domini, 1616, 4to. 2. Tabula Chronographica, à captâ per Pompeium, Jerosolymâ ad deletam à Tito urbem, 1605, 4to.

DELACERA'TION. *s.* (from *delacero*, Lat.) A tearing in pieces.

DELACRYMA'TION. *s.* (*delacrymatio*, Lat.) The waterishness of the eyes.

DELACTA'TION. *s.* (*delactatio*, Lat.) A weaning from the breast.

DELANY (Patrick), a divine of considerable learning and ingenuity. He was the son of a farmer in Ireland, and born in that kingdom about 1686. His learning and degrees were acquired at Trinity college, Dublin, where also he was elected fellow. He formed an early intimacy with dean Swift, in whose works are some slight pieces, mostly humourous, of Dr. Delany's. He obtained some church preferment from lord Carteret; and in 1732, published in London his work entitled Revelation examined with Candour; and the same year he married. In 1738 appeared his Reflections upon Polygamy. His next publication was the Life of David, King of Israel; which is an ingenious and elaborate performance. (See DAVID.) In 1743 he married a second wife, who was the widow of Mr. Pendarves of Cornwall. The year following he obtained the deanery of Downe. When lord Orrery published his Remarks on the Life and Writings of Swift, Dr. Delany conceived it expedient to give a reply, which he did with great spirit; and his performance certainly affords a better idea of the dean than can be obtained from that of lord Orrery. He continued publishing something or other nearly till his death, which happened at Bath in 1768. His Sermons on Social Duties are very excellent. Indeed all his works exhibit tokens of real piety, as well as of vigorous understanding. His Revelation Examined is an admirable performance, being a complete and eloquent refutation of many of the grand arguments of the deists.

DELAPSE. In medicine. See Prolapse.

DELA'PSED. *a.* (from *delapsus*, Latin.) Bearing or falling down.

To DELA'TE. *v. a.* (from *delatus*, Latin.) 1. To carry; to convey (*Bacon*). 2. To accuse; to inform against.

DELATION. *s.* (*delatio*, Lat.) 1. A carriage; conveyance (*Bacon*). 2. An accusation; an impeachment.

DELA'TOR. *s.* (*delator*, Lat.) An accuser; an informer (*Government of the Tongue*).

DELAWARE, one of the United States of America, bounded on the N. by Pennsylvania, on the E. by Delaware river and bay, and on the S. and W. by Maryland. It is ninety miles long, and sixteen broad; and in many parts is unhealthy, being seated in a peninsula where the land is generally low. It is divided into three counties, Newcastle, Kent, and Sussex. In 1790 the number of inhabitants was 59,094.

Delaware, a county of Pennsylvania, twenty miles long, and eleven broad. In 1790 it contained 9,483 inhabitants. Chester is the capital.

Delaware, a river of N. America, which rising in the state of New York, in lake Ustayantho, divides New York from Pennsylvania, and passes through Delaware bay to the Atlantic, having New Jersey on the E. side, and Pennsylvania, and the state of Delaware, on the W. From the mouth of this very extensive bay, at cape Henlopen, to Philadelphia, it is 118 miles, with a sufficient depth of water for a seventy-four gun ship; above Philadelphia it is navigable for sloops up to the great falls at Trenton, and for boats that carry eight or ten tons, forty miles higher.

To DELA'Y. *v. a.* (from *delayer*, French.) 1. To defer; to put off (*Exodus*). 2. To hinder; to frustrate. 3. To stop or retard the course of (*Dryden*).

To Dela'y. *v. n.* To stop; to cease from action (*Locke*).

Dela'y. *s.* (from the verb.) 1. A deferring; procrastination (*Shakspeare*). 2. Stay; stop (*Dryden*).

DELA'YER. *s.* (from *delay*.) One that defers.

DELE'CTABLE. *a.* (*delectabilis*, Latin.) Pleasing; delightful (*Philips*).

DELE'CTABLENESS. *s.* Delightfulness; pleasantness.

DELE'CTABLY. *ad.* Delightfully; pleasantly.

DELECTA'TION. *s.* (*delectatio*, Latin.) Pleasure; delight (*More*).

To DE'LEGATE. *v. a.* (*delego*, Latin.) 1. To send away. 2. To send upon an embassy. 3. To intrust; to commit to another (*Taylor*). 4. To appoint judges to a particular cause.

De'legate. *s.* (*delegatus*, Lat.) A deputy; a commissioner; a vicar; any one that is sent to act for another (*Taylor*).

De'legate. *a.* (*delegatus*, Lat.) Deputed; sent to act for another (*Taylor*).

De'legates (Court of). A court wherein all causes of appeal, by way of devolution from either of the archbishops, are decided (*Ayliffe*).

DELEGA'TION. *s.* (*delegatio*, Latin.) 1. A sending away. 2. A putting in commission. 3. The assignment of a debt to another.

DELENI'FICAL. *a.* (*delenificus*, Latin.) Having virtue to assuage or ease pain.

To DELE'TE. *v. a.* (from *deleo*, Latin.) To blot out.

DELETERIOUS. (*deleterius*, δηλητηριος, from δηλεω, to hurt or injure.) Those substances are so called, which are of a baneful or poisonous nature.

DELETERY. *a.* Destructive; deadly (*Hudibras*).

DELE'TION. *s.* (*deletio*, Latin.) 1. Act of raising or blotting out. 2. A destruction (*Hale*).

DELF. Delfe. *s.* (from delfan, Saxon, to dig.) 1. A mine; a quarry (*Ray*). 2. Earthen ware; counterfeit China ware, made at Delft in Holland (*Smart*).

DELFT, a city of the United Provinces, and capital of Delftland, in Holland. It is clean and well built, with canals in the streets. It is noted for its manufacture of earthen ware, known by the name of Delft-ware. Lat. 52. 4 N. Lon. 4. 24 E.

Delft-ware, a kind of pottery of baked earth, covered with an enamel or white glazing, which gives it the appearance and neatness of porcelain. Some kinds of this enamelled pottery differ much from others, either in their sustaining sudden heat without breaking, or in the beauty and regularity of their forms, of their enamel, and of the painting with which they are ornamented. In general, the fine and beautiful enamelled potteries, which approach the nearest to porcelain in external appearance, are at the same time those which least resist a brisk fire. Again, those which sustain a sudden heat are coarse, and resemble common pottery.

The basis of this pottery is clay, which is mixed, when too fat, with such a quantity of sand, that the earth shall preserve enough of its ductility to be worked, moulded, and turned easily; and yet that its fatness shall be sufficiently taken from it, that it may not crack or shrink too much in drying or in baking. Vessels formed of this earth must be dried very gently to avoid cracking. They are then to be placed in a furnace to receive a slight baking, which is only meant to give them a certain consistence or hardness. And, lastly, they are to be covered with an enamel or glazing, which is done, by putting upon the vessels thus prepared the enamel, which has been ground very fine, and diluted with water.

As vessels on which the enamel is applied are but slightly baked, they readily imbibe the water in which the enamel is suspended, and a layer of this enamel adheres to their surface: these vessels may then be painted with colours composed of metallic calces, mixed and ground with a fusible glass. When they are become perfectly dry, they are to be placed in the furnace, included in cases of baked earth called seggars, and exposed to a heat capable of fusing uniformly the enamel which covers them. This heat given to fuse the enamel being much stronger than that which was applied at first to give some consistence to the ware, is also the heat necessary to complete the baking of it. The furnace and colours used for painting this ware are the same as those employed for porcelain.

DELHI. In geography. See DEHLI.

DELIA, in antiquity, a festival celebrated in the island of Delos, every fifth year, in honour of Apollo.

DELIA, a surname of Diana.

DELIAC, DELIACUS, among the ancients, a poulterer, or one who fattened and sold fowls: they were so called because the people of the isle of Delos first followed that occupation.

DELIACAL, or **DELIAN PROBLEM**. See DUPLICATION.

DELIBAMENTA, in antiquity, a libation offered to the infernal gods, which was always poured downwards; hence this act was expressed by the word *defundere*.

DELIBA'TION. *s.* (*delibatio*, Lat.) An essay; a taste.

To **DELI'BERATE.** *v. a.* (*delibero*, Lat.) To think, in order to choice; to hesitate (*Addison*).

DELI'BERATE. *a.* (*deliberatus*, Lat.) 1. Circumspect; wary; advised; discreet (*Shakspeare*). 2. Slow; tedious; gradual (*Hooker*).

DELI'BERATELY. *ad.* 1. Circumspectly; advisedly; warily (*Dryden*). 2. Slowly; gradually.

DELI'BERATENESS. *s.* Circumspection; weariness; coolness; caution (*King Charles*).

DELIBERA'TION. *s.* (*deliberatio*, Latin.) The act of deliberating; thought in order to choice (*Hammond*).

DELI'BERATIVE. *a.* (*deliberativus*, Lat.) Pertaining to deliberation; apt to consider.

DELI'BERATIVE. *s.* (from the adjective.) The discourse in which a question is deliberated (*Bacon*).

DE'LICACY. *s.* (*delicatesse*, French.) 1. Daintiness; pleasantness to the taste (*Milton*). 2. Any thing highly pleasing to the senses (*Milton*). 3. Softness; feminine beauty (*Sidney*). 4. Nicety; minute accuracy (*Dryden*). 5. Neatness; elegance of dress. 6. Politeness of manners. 7 Indulgence; gentle treatment (*Temple*). 8. Tenderness; scrupulousness (*Addison*). 9. Weakness of constitution. 10. Smallness; tenuity.

DE'LICATE. *a.* (*delicat*, French.) 1. Nice; pleasing to the taste; of an agreeable flavour (*Taylor*). 2. Dainty; desirous of curious meats. 3. Choice; select; excellent. 4. Pleasing to the senses. 5. Fine; consisting of small parts (*Arbuthnot*). 6. Of polite manners; not gross, or coarse. 7. Soft; effeminate; unable to bear hardships (*Shakspeare*). 8. Pure; clear (*Shakspeare*).

DE'LICATELY. *ad.* 1. Beautifully; with soft elegance (*Pope*). 2. Finely; not coarsely. 3. Daintily (*Taylor*). 4. Choicely. 5. Politely. 6. Effeminately.

DE'LICATENESS. *s.* (from *delicate.*) The state of being delicate; tenderness; softness; effeminacy (*Deuteronomy*).

DE'LICATES. *s.* (from *delicate.*) Niceties; rarities; that which is choice and dainty (*King*).

DE'LICES. *s. pl.* (*deliciæ*, Lat.) Pleasures (*Spenser*).

DELI'CIOUS. *a.* (*delicieux*, Fr.) Sweet; delicate; that affords delight; agreeable (*Pope*).

DELI'CIOUSLY. *ad.* Sweetly; pleasantly; delightfully (*Revelation*).

DELI'CIOUSNESS. *s.* (from *delicious.*) Delight; pleasure; joy (*Taylor*).

DELIGA'TION. *s.* (*deligatio*, Latin.) A binding up, in surgery (*Wiseman*).

DELI'GHT. *s.* (*delice*, French.) 1. Joy; content; satisfaction (*Samuel*). 2. That which gives delight (*Shakspeare*).

To **DELI'GHT.** *v. a.* (*delector*, Latin.) To please; to content; to satisfy (*Locke*).

To **DELI'GHT.** *v. n.* To have delight or pleasure in (*Psalms*).

DELI'GHTFUL. *a.* (from *delight* and *full.*) Pleasant; charming (*Sidney*).

DELI'GHTFULLY. *ad.* Pleasantly; charmingly; with delight (*Milton*).

DELI'GHTFULNESS. *s.* (from *delight.*) Pleasure; comfort; satisfaction (*Tillotson*).

DELI'GHTSOME. *a.* (from *delight.*) Pleasant; delightful (*Grew*).

DELI'GHTSOMELY. *ad.* Pleasantly; in a delightful manner.

DELI'GHTSOMENESS. *s.* (from *delightsome.*) Pleasantness; delightfulness.

DELIMA. In botany. See TETRACERA.

To **DELI'NEATE.** *v. a.* (*delineo*, Latin.) 1. To make the first draught of a thing; to design; to sketch. 2. To paint; to represent a true likeness in picture (*Brown*). 3. To describe; to set forth in a lively manner (*Raleigh*).

DELINEA'TION. *s.* (*delineatio*, Latin.) The first draught of a thing (*Mortimer*).

DELI'NQUENCY. *s.* (*delinquentia*, Lat.) A fault; a failure in duty (*Sandys*).

DELI'NQUENT. *s.* (from *delinquens*, Lat.) An offender (*Ben Jonson*).

To **DELI'QUATE.** *v. n.* (*deliqueo*, Latin.) To melt; to be dissolved (*Cudworth*).

DELIQUA'TION. *s.* (*deliquatio*, Lat.) A melting; a dissolving.

DELIQUESCENCE, deliquation, or the gradually melting down of crystallized salts, from exposure to the air.

DELIQUIUM, the liquid state, into which a salt is reduced by exposure to the air. Thus, alkali reduced by this means to a liquid state was formerly called oil of tartar, *per deliquium*.

DELIQUIUM ANIMI. See SYNCOPE.

DELI'RAMENT. *s.* (*deliramentum*, Lat.) A doating or foolish fancy.

To DELI'RATE. *v. n.* (*deliro*, Latin.) To dote; to rave; to talk or act idly.

DELIRA'TION. *s.* (*deliratio*, Latin.) Dotage; folly; madness.

DELI'RIOUS. *a.* (*delirius*, Latin.) Lightheaded; raving; doting (*Swift*).

DELI'RIUM. (*delirium*, from *deliro*, to rave.) A febrile symptom, consisting in the person's acting or talking unreasonably. It is to be carefully distinguished from an alienation of the mind, without fever.

To DELI'VER. *v. a.* (*delivrer*, French.) 1. To set free; to release (*Prior*). 2. To save; to rescue (*Shakspeare*). 3. To surrender; to put into one's hands (*Samuel*). 4. To give; to offer; to present (*Dryden*). 5. To cast away; to throw off (*Pope*). 6. To disburden a woman of a child (*Peacham*). 7. To speak; to tell; to relate; to utter (*Swift*).

To Deli'ver *over. v. a.* 1. To put into another's hands (*Shakspeare*). 2. To give from hand to hand (*Dryden*).

To Deliver *up. v. a.* To surrender (*Shakspeare*).

DELI'VERANCE. *s.* (*delivrance*, French.) 1. The act of freeing from captivity, slavery, or any oppression; rescue (*Dryden*). 2. The act of delivering a thing to another. 3. The act of bringing children (*Shakspeare*). 4. The act of speaking; utterance (*Shakspeare*).

DELI'VERER. *s.* (from *deliver.*) 1. A saver; a rescuer; a preserver (*Bacon*). 2. A relater; one that communicates something by speech or writing (*Boyle*).

DELI'VERY. *s.* (from the verb.) 1. The act of delivering, or giving. 2. Release; rescue; saving (*Shakspeare*). 3. A surrender; act of giving up (*Clarendon*). 4. Utterance; pronunciation; speech (*Hooker*). 5. Use of the limbs; activity (*Wotton*). 6. Childbirth. See Midwifery.

DELL. *s.* (from *dal*, Dutch.) A pit; a hole in the ground (*Tickel*).

DELOS, an island of the Archipelago, now called Dili. There are abundance of fine ruins, supposed to be of the temples of Diana and Apollo, whose birth-place it is said to be. It is six miles in circumference, but it is now quite destitute of inhabitants. Lat. 37. 30 N. Lon. 25. 59 E.

So very sacred was the island of Delos held by the ancients, that no hostilities were practised there, even by the nations that were at war with one another, when they happened to meet in this place. It was called Delos from δηλος, because it suddenly made its appearance on the surface of the sea, by the power of Neptune. (See Apollo.) One of the altars of Apollo, in the island, was reckoned among the seven wonders of the world. It had been erected, according to mythologists, by Apollo when only four years old, and made with the horns of goats, killed by Diana on mount Cynthus. It was unlawful for a man to die, or for a child to be born there; and an edict was issued, which commanded all persons labouring under any mortal or dangerous disease to be instantly removed to the adjacent island called Rhane.

DELPH. See Delft.

DELPHIN, in literary history, a name given to the commentators on the ancient Latin authors, who were employed by order of Louis XIV. of France, for the benefit of the prince, under the care and direction of M. de Montausier his governor, Bossuet and Huet his preceptors. They were thirty-nine in number.

DELPHINIA, in antiquity, feasts celebrated by the inhabitants of Egina, in honour of Apollo, surnamed Delphinius.

DELPHINIUM. Larkspur. In botany, a genus of the class polyandria, order digynia. Calyxless; petals five; nectary cloven, elongated behind into a horn; siliques three or one. Fourteen species; of which a few possess only one capsule, but the majority three. These are chiefly found wild in the south of Europe: three or four of which are cultivated in our gardens. Two or three species in this genus are perennial. Those chiefly worthy of notice are,

1. D. consolida. Common larkspur; found in our own fields, with a one-leafed nectary, and subdivided stem: the petals are easily doubled by propagation, and are in colour usually blue, red, pink, or violet. This plant is called in the dispensatories Calcitrappa, and Consolida regalis, which see.

2. D. peregrinum; with a two-leaved nectary; corol nine-petalled; leaves many-parted, obtuse. A native of the south of Europe.

3. D. staphisagria. Staves-acre; louse wort; nectary four-leaved, shorter than the petals; leaves palmate, with obtuse lobes. Indigenous also to the south of Europe. The seeds are still an article in some pharmacopœias; and their supposed use will be found under the officinal name Staphisagria, which see.

DELPHINUS, in astronomy, the Dolphin, an old northern constellation. It consists of eighteen stars of the first six magnitudes, viz. 0.0.6 0.2.10.

Delphinus, in zoology, order cete. Teeth in both jaws; bony. The species are the five i. e. following.

1. D. phocæna. Porpoise, or porpus (*le pore poisson.*) Sea-hog. Body subconic; back broad; snout bluntish. Colour of the body blueish, black above; white beneath; head obtuse, eyes small, the entrance to the ear placed behind them, and between them a semilunar fistula; teeth small, acute; in each jaw forty-six; orifice of the penis near the navel linear; anus a little two-lobed, between that and the tail. In the times of Henry VIII. and Elizabeth, reckoned a delicacy and a royal dish. Inhabits the European and Baltic oceans; and is found at times on all the coasts of our own country, following greedily the track of the migratory fishes, as mackerel, herrings, and salmon; tumbling over and darting

in the water; length from five to eight feet. See Nat. Hist. Pl. LXXIV.

2. D. delphis. Dolphin. Body oblong, roundish: snout narrow, sharp, with a broad, transverse projection of the skin, on its upper part; teeth subulate; twenty-one above, nineteen below, locking into each other; mouth extensive, reaching almost to the thorax; kidney conglomerate. Inhabits the European and Pacific seas, and is occasionally found on our own coasts; swims with velocity, preys on fishes; and dexterously fastens itself to the back of whales as they leap out of water, making them bellow with its gripe; swims in nearly a straight line, and only appears of a crooked form, such as is commonly represented in our paintings of this mammal when leaping out of water itself; from nine to ten feet long: slenderer than d. phocæna. See Nat. Hist. Pl. LXXIV.

3 D. orca. Grampus. Snout turned up; teeth broad and serrate. Another variety, with snout a little truncate; teeth pointed; dorsal fin long and bony: known by the name of sword-grampus. The body of both black above, white beneath; lower jaw much longer than the upper; teeth forty, obtuse; eyes small; spiracle two-celled; fin broader at the base, resembling a scymetar. Inhabits the European and Atlantic seas, and occasionally our own coasts: twenty-four feet long, twelve broad; like d. delphis, but with far more violence attacks and adheres to the backs of whales, and often destroys them: fights likewise with seals, often pushing them from the rocks they inhabit by its long dorsal fin. See Nat. Hist. Pl. LXXV.

4. D. leucas. White dolphin: by the Russians named belluga. Snout conic, obtuse, inclined outwards; without dorsal fin. Head oblong, small; eyes minute, round, prominent; spiracle on the forehead, divided by a partition; teeth nine on each side of each jaw, short, bluntish; pectoral fins soft with five bones: tail cartilaginous, two-lobed; teats two, filled with white milk. Inhabits the arctic pole; sometimes ascends rivers, gregarious; to the touch smooth and slippery; when young, dusky in colour, but afterwards white; eighteen feet long. See Nat. Hist. Pl. LXXV.

5. D. melas: snout obtuse: almost the whole body black, smooth, and shining like oiled silk. The back and sides jetty black; the breast and belly of a somewhat lighter colour. The general length of the full grown ones about twenty feet. The body thick. The dorsal fin does not exceed two feet in length, and rounded at the extremity. The pectoral fins from six to eight feet in length, narrow, and tapering to their extremities. The head obtuse; the upper jaw projects several inches over the lower in a blunt process. It has a single spiracle. The full grown have twenty-two subconoid sharp teeth, a little hooked. Among those stranded lately in Scapay bay, were many young ones, which, as well as the oldest, wanted teeth. The youngest measured about five feet in length, and were still sucklings. The females had two teats, larger than those of a cow, out of which the milk flowed when they were squeezed.

We have introduced this last species into the genus delphinus, from Mr. Neil's Tour through the Hebrides, in which we are told that 310 of this species were driven on shore in Shetland, in 1805. Mr. Neil's description, however, is imperfect; and Dr. Trail, from whom we have taken the specific name and character, has given a much better account in Nicholson's Journal for February 1809, in a paper which states also, that ninety-two of the same species of delphinus were stranded in Scapay bay in Pomona, one of the Orkneys, a few days previous to the great storm in December 1806.

These animals are gregarious, generally swimming in considerable numbers. They frequently enter the bays around the Orkney coast in quest of small fish, which seem to be their food. When one of them takes the ground, the rest surround, and endeavour to assist it: from this circumstance several of them are generally taken at once. Dr. T. has frequently observed an animal, which he conjectures to be of this species, elevating its dorsal fin and a considerable part of its back above the waves, with a slow tumbling motion for many successive times. They are inoffensive, and rather timid. They are chased on shore not unfrequently by a few yawls. They seem generally to follow one as a leader with blind confidence. He once was in a boat when the attempt was made to drive a shoal of them on shore; but when they had approached very near the land, the foremost turned round with a sudden leap, and the whole rushed past with great velocity, but carefully avoided the boat. They are extremely fat, and yield a considerable quantity of good oil.

DELPHOS, in antiquity, now called Castri, the capital of Phocis in Achaia; anciently much celebrated for its temple, and oracle of Apollo. This temple was a magnificent structure, enriched with innumerable gifts; in it was the dark cave Pythium, where the priestess, named Pythia, sitting on a tripos, or three-legged stool, pretended to receive the inspiration of the god, swelling, foaming, and raving, like one distracted. The answers were always ambiguous, and so mysterious, that it was difficult to understand them. At present the town of Castri does not consist of above two hundred houses, and those very ill built. It stands between Salona and Livadia, about ten miles distant from the latter, on the south side of mount Parnassus, so famous in antiquity, and sacred to the Muses and Apollo.

DELTA, one of the ancient divisions of Egypt, so called from its triangular figure. It is 130 miles along the coast from Damietta to Alexandria, and 70 on the sides, from where the Nile begins to be divided into branches.

DELTOID LEAF, in botany, folium deltoides, or deltoideum. Rhombeum ex quatuor angulis, e quibus laterales minus a basi distant quam reliqui. Shaped like a rhomb, having four angles, of which the lateral ones are less distant from the base than the others. Or more correctly, a deltoid leaf has the general appearance of a delta or triangle, but in reality it approaches in figure to a rhomb, and like that has four angles, of which the two side ones are always nearer to each other than the two others at the base and apex; so that the length of the leaf is somewhat greater than the breadth. All this will be best understood by examining a leaf of the common black poplar, which is given as one instance of a deltoid leaf in Linnéus's Specific Characters. Other instances are, several species of chenopodium and atriplex: cochlearia danica: alyssum sinuatum and deltoideum. If it should be objected, that a leaf cannot have the form both of a delta and a rhomb, it should be observed in reply, that Linnéus affirms no more than that this leaf has the appearance of a delta, with a resemblance to a rhomb; and that it would be absurd to expect mathematical exactness in substances so various in their forms as leaves. Dr. Withering translates deltoideus triangularly spear-shaped; and says, that leaves in this form are broad at the base and nearly triangular, but spear-shaped at the point; as in the black poplar.

With respect to mesembryanthemum deltoides, there is no doubt that it was so named, because each side of its succulent leaves is in form of a triangle, and therefore corresponds with the figure of the Greek letter delta.

DELTOIDES. (δελτοειδὴς, from the Greek Δ or δελτα, and ειδος, a likeness; shaped like the Greek delta.) A muscle of the superior extremity, situated on the shoulder. It arises exactly opposite to the trapezius from one-third part of the clavicule, from the acromium and spine of the scapula, and is inserted, tendinous, into the middle of the os humeri, which bone it lifts up directly; and it assists with the supra-spinatus and coracobrachialis in all the actions of the humerus, except the depression; it being convenient that the arm should be raised and sustained, in order to its moving on any side.

DELU'DABLE. *a.* (from *delude.*) Liable to be deceived (*Brown*).

To DELU'DE. *v. a.* (*deludo,* Latin.) 1. To beguile; to cheat; to deceive (*Dryden*). 2. To disappoint; to frustrate.

DELU'DER. *s.* (from *delude.*) A beguiler; a deceiver; an impostor; a cheat (*Granville*).

To DELVE. *v. a.* (ꝺelꝼan, Saxon.) 1. To dig; to open the ground with a spade (*Philips*). 2. To fathom; to sift (*Shakspeare*).

Delve. *s.* (from the verb.) A ditch; a pit; a den; a cave (*Ben Jonson*).

DE'LVER. *s.* (from *delve.*) A digger.

DE'LUGE. *s.* (*deluge,* French.) 1. A general inundation (*Burnet*). 2. An overflowing of the natural bounds of a river (*Denham*). 3. Any sudden and resistless calamity.

Deluge, Diluvium, in natural history, a flood, or inundation of water, covering the earth, either in the whole or in part. We meet with various accounts of deluges in ancient history, both sacred and profane: that which happened in Greece, in the time of Deucalion, called *diluvium Deucalioneum,* is famous: this deluge only overflowed Thessaly. Its date is fixed to the year before Christ 1529, being the third year before the Israelites coming out of Egypt, according to the computation of Petavius, Rat. Temp. par. i. lib. i. cap. 7. The deluge of Ogyges happened near 300 years before that of Deucalion, 1020 years before the first Olympiad, and 1796 before Jesus Christ, according to the same author, Rat. Tem. par. i. lib. i. cap. 4. par. ii. lib. ii. cap. 5. This only ravaged Attica. These two deluges are frequently mentioned, in ancient Greek authors, under the denomination of *cataclysmus prior* and *posterior*. Of the like kind were those inundations in the Netherlands, which, in 1727, overwhelmed and covered with sea all that part now called the gulf Dollart in the United Netherlands, and in 1421, all that part situated between Brabant and Holland.

But the most memorable deluge is that which we particularly, by way of eminence, call the deluge, or the universal deluge, or Noah's flood; recorded in Scripture as a general inundation sent by God to punish the corruption of the world, at that time, by destroying every thing (Noah and his family, and what was shut up with him in the ark, only excepted) from the face of the earth. This flood makes one of the most considerable epochas in chronology. Its history is given by Moses, Gen. ch. vi. and vii. Its time is fixed, by the best chronologers, to the year from the creation 1656, answering to the year before Christ 2293. From this flood, the state of the world is divided into diluvian and antediluvian.

The deluge has been, and remains, a subject of much enquiry and dispute among naturalists, critics, &c. The points chiefly controverted may be reduced to three: first, its extent, viz. whether it were general, or partial; secondly, its natural cause; and, thirdly, its effects.

1. The immense quantity of water requisite, to furnish an universal deluge, has occasioned several authors to suspect it only partial. An universal deluge, they think, had been unnecessary, considering the end for which it was brought: viz. to extirpate the wicked inhabitants. The world was then but new, and the people not very many: the holy Scriptures making only eight generations from Adam to Noah. It was but a small part of the earth that could be yet inhabited: the country about the Euphrates, which is supposed to have been the scene of the first antediluvian inhabitants, was sufficient to bear them all. Now Providence, say they, which ever acts wisely and frugally, would never have disproportioned the means to the end, so far as to overflow the whole globe, only to drown a little corner of it. They add, that, in the Scripture-language, the whole earth expresses no more than all the inhabitants; and on this principle advance, that an overflowing of the Euphrates and Tigris, with a vehement rain, &c. might answer all the phenomena of the deluge.

But the deluge was universal. God declared to Noah, Gen. vi. 17, that he was resolved to destroy every thing that had breath under heaven, or had life on the earth, by a flood of waters: such was the menace; such the execution. The waters, Moses assures us, covered the whole earth, buried all the mountains, and were no less than fifteen cubits above the highest of them: every thing perished therein; birds, beasts, men, and all that had life, excepting Noah, and those with him in the ark, Gen. vii. 19, &c. Can an universal deluge be more clearly expressed? If the deluge had only been partial, there had been no necessity to spend a hundred years in the building of an ark, and shutting up all the sorts of animals therein, in order to re-stock the world: they had been easily and readily brought from those parts of the world not overflowed, into those that were; at least, all the birds would never have been destroyed, as Moses says they were, so long as they had wings to bear them to those parts where the flood did not reach. If the waters had only overflowed the neighbourhood of the Euphrates and Tigris, they could not be fifteen cubits above the highest mountains; they could not have risen to that height but they must spread themselves, by the laws of gravity, over the rest of the earth; unless, perhaps, they had been retained there by a miracle; and, in that case, Moses, no doubt, would have related the miracle, as he did that of the waters of the Red sea, and the river Jordan, which were sustained in a heap, to give passage to the Israelites, Exod. xiv. 22. and Josh. iii. 16. Add, that in regions far more remote from the Euphrates and Tigris, viz. in Italy, France, Switzerland, Germany, England, &c. there are frequently found in places many scores of leagues from any sea, and even in the tops of high mountains, whole trees sunk deep under ground; as also teeth and bones of animals, fishes entire, sea-shells, ears of corn, &c. petrified; which the best naturalists are agreed could never have come there but by the deluge: to which may be added the almost universal traditions of this great event in all countries of the globe.

The consideration of the various theories which have been offered to account for the cause, explain the effects, and evince the reasonableness of a belief in the deluge, would take up much more space than we can devote to the purpose. We, therefore, refer those whose inclination leads them to such disquisitions, to the following works. Burneti Telluris Theor. Sacra, Keill's Examination of Burnet's Theory of the Earth, Whiston's New Theory of the Earth, and Keill's Remarks on ditto; Saurin's Dissertations, Delany's Revelation examined with Candour, Whitehurst on the Formation of the Earth, Bryant's Analysis of Ancient Mythology, vol. ii., and Kirwan's Paper in the sixth volume of the Transactions of the Royal Irish Academy.

To **De'luge.** *v. a.* (from the noun.) 1. To drown; to lay totally under water (*Blackmore*). 2. To overwhelm; to cause to sink (*Pope*).

DELU'SION. *s.* (*delusio*, Latin.) 1. A cheat; guile; deceit; treachery. 2. A false representation; illusion; errour; a chimerical thought (*Prior*).

DELU'SIVE. Delu'sory. *a.* (from *delusus*, Latin.) Apt to deceive; beguiling; imposing on (*Woodward. Glanville*).

DEMADES, an Athenian, who, from a sailor, became an eloquent orator. He was taken prisoner at the battle of Cheronæa, by Philip, by whom he was greatly esteemed. He was put to death, with his son, on suspicion of treason, B.C. 322. One of his orations is extant. (*Diod.*).

DE'MAGOGUE. *s.* (δημαγωγος.) A ringleader of the rabble (*South*).

DEMAIN, or **Demesne**, in its popular sense, denotes the lord's manor place, with the lands thereto belonging; which he and his ancestors have from time to time kept in their own manual occupation. See Manor.

Demain, or **Demesne**, in a law sense, signifies, according to Hottoman, *patrimonium domini*, the lord's patrimony; called also domain, and by the civilians *dominicum*. The same author proves those lands to be demain, which a man holdeth originally of himself; and those to be *feodum*, which he holdeth of a superior lord. In England, no common person has any demain, simply understood; for all depends either mediately, or immediately, on the crown. When a man, therefore, in pleading, would signify his land to be his own, he saith, that he is or was seised thereof in his domain, as of fee; whereby he means, that although his land be to him and his heirs for ever, yet it is no true demain, but depends upon a superior lord, and he holdeth by service, or rent in lieu of service, or by both service and rent.

Demain is sometimes also taken, more largely, for lands and tenements held for life, &c. and sometimes more strictly for such only as are generally held in fee.

Demain is sometimes again used for a distinction between those lands that the lord of a manor has in his own hands, or in the hands of his lessee, demised upon a rent, for a term of years, or life; and such other lands, pertaining to the said manor, which belong to the free or copy-holders. The reason why the copy-hold is accounted demain, is because they, who are tenants to it, are judged in law to have no other right but at the will of the lord; so that it is reputed still, after a sort, to be in the lord's hands; and yet, in common speech, that is ordinarily called demain which is neither free nor copy-free.

Demain, again, is used in a more special signification, in opposition to frank-fee.

DEMAND. *s.* (*demande*, Fr.) 1. A claim; a challenging (*Locke*). 2. A question, an interrogation. 3. The calling for a thing in order to purchase it (*Addison*).

Demand, in law, calling upon a man for any sum or sums of money, or any other thing due. By the several statutes of limitation, debts, claims, &c. are to be demanded and made in time, or they will be lost by law. There are two manner of demands, the one in deed, the other in law; in deed, as in every precepe there is an express demand; in law, as in every entry in land, distress for rent, taking or seizing of goods, and such like acts, which may be done without any words, are demands in law.

Where there is a duty which the law makes payable on demand, no demand need be made; but if there be no duty till demand, in such case there must be a demand to make the duty.

To DEMA'ND. *v. a.* (*demander*, French.) 1. To claim; to ask for with authority (*Shakspeare*). 2. To question; to interrogate (*Peacham*).

DEMA'NDABLE. *a.* (from *demand.*) That may be demanded, requested, asked for (*Bacon*).

DEMA'NDANT. *s.* (from *demand.*) He who is actor or plaintiff in a real action (*Coke*).

DEMA'NDER. *s.* (*demandeur*, French.) 1. One that requires a thing with authority. 2. One that asks a question. 3. One that asks for a thing in order to purchase it (*Carew*). 4. A dunner; one that demands a debt.

DEMARCHUS, in antiquity, the chief of a region or district. The chief magistrate of the city of Neapolis was also called demarchus.

DEME'AN. *s.* (from *demener*, Fr.) Mien; presence; carriage (*Spenser*).

To DEME'AN. *v. a.* (from *demener*, Fr.) 1. To behave; to carry one's self (*Tillotson*). 2. To lessen; to debase; to undervalue (*Shakspeare*).

DEME'ANOUR. *s.* (*demener*, Fr.) Carriage; behaviour (*Clarendon*).

DEME'ANS, or DEME'SNES. *s. pl.* An estate in lands.

To DEME'NTATE. *v. n.* (*demento*, Latin.) To make mad.

DEMENTA'TION. *s.* (*dementatio*, Lat.) Making mad, or frantick.

DEME'NTIA. (*dementia*, from *de* and *mens*, without mind.) Madness, delirium, absence of intellect

DEMERARA, or DEMERARY. See ISSEQUIBO.

DEME'RIT. *s.* (*demerite*, Fr.) The opposite to merit; ill-deserving (*Temple*).

To DEME'RIT. *v. a.* (*demeriter*, Fr.) To deserve blame or punishment.

DEMERSE LEAF, in botany, growing below the surface of the water. Frequent in aquatic plants. The same explanation applies to submerse.

DEME'RSED. *a.* (from *demersus*, Latin.) Plunged; drowned.

DEME'RSION. *s.* (*demersio*, Latin.) A drowning.

DEMESNE. See DEMAIN.

DEMETÆ, in ancient geography, were inhabitants of South Wales, occupying those parts which are now called *Caermarthenshire*, Pembrokeshire, and Cardiganshire.

DEMETRIA, in antiquity, a festival in honour of Ceres, called by the Greeks Demeter.

DEMETRIOWITZ, a town of Smolensko, in Russia, seated on the river Ugra. Lat. 53. 40 N. Lon. 36. 5 E.

DEMETRIUS PHALERUS, a celebrated orator and peripatetic philosopher, was the scholar of Theophrastus. He acquired so much authority at Athens, that he governed the city for ten years; and ruled with so much wisdom and virtue, that they set up thirty-six statues in honour of him. Demetrius composed more works in prose and verse than any other peripatetic of his time; and his writings consisted of poetry, history, politics, rhetoric, harangues, and embassies. None of them are extant except his rhetoric, which is usually printed among the Rhetores Selecti.

DEMETRIUS, a cynic philosopher, disciple of Apollonius Tyanæus, in the age of Caligula. The emperor wished to gain the philosopher to his interest by a large present; but Demetrius refused it with indignation, and said, "If Caligula wish to bribe me, let him send me his crown." Vespasian was displeased with his insolence, and banished him to an island. The cynic derided the punishment, and bitterly inveighed against the emperor. He died in a great old age; and Seneca observes, that "nature had brought him forth to show mankind that an exalted genius can live securely, without being corrupted by the vices of the world."

DEMI. (*demi*, Fr. from *dimidium*, Lat.) A word much used in composition with other words to signify half. In words borrowed from the Latin we use semi. See SEMI.

DEMI BASTION, a fortification having only one face and one flank. See BASTION.

DEMI-CADENCE, a term used in church-music. When the last or final sound of a verse in a chant is on the key-note, it is called a full, or complete cadence: but if it fall on any other than the key-note, as the fifth or third, it takes the name of an imperfect or demi-cadence. The termination in this case is postponed to the succeeding verse. Almost all our double chants afford examples of a demi-cadence. (*Busby*).

DE'MI-CANNON (Lowest). A great gun that carries a ball thirty pounds weight.

DE'MI-CANNON (Ordinary). A great gun that carries a shot thirty-two pounds weight.

DE'MI-CANNON (Of the greatest size). A gun that carries a ball of thirty-six pounds weight (*Wilkins*).

DEMI-CROSS, an instrument used by the Dutch to take the altitude of the sun or a star at sea; instead of which we use the cross-staff, or forestaff.

DE'MI-CULVERIN (Of the lowest size). A gun that carries a ball nine pounds weight.

DE'MI-CULVERIN (Ordinary). A gun that carries a ball ten pounds eleven ounces weight.

DE'MI-CULVERIN (Elder sort). A gun that carries a ball twelve pounds eleven ounces weight (*Clarendon*).

DE'MI-DEVIL. *s.* Half a devil (*Shakspeare*).

DEMIDITONE, in music, a minor third.

DE'MI-GOD. *s.* An hero partaking of divine nature; half a god (*Pope*).

DE'MI-LANCE. *s.* A light lance (*Dryden*).

DEMI-LUNE, or HALF-MOON, a small

flanked bastion, placed before the point of a bastion when it is too weak.

DEMI-QUAVER, a note in music, two of which are equal to a quaver. See Semiquaver and Quaver.

DEMISEMIQUAVER, in music, one-fourth of a quaver.

DEMITONE. In music. See Semitone.

DE'MI-WOLF. *s.* Half a wolf (*Shakspeare*).

DEMI'SE. *s.* (from *demetre, demis, demise,* Fr.) Death; decease (*Swift*).

To Demi'se. *v. a.* (*demise*, Fr.) To grant at one's death; to bequeath (*Swift*).

DEMI'SSION. *s.* (*demissio*, Lat.) Degradation; diminution of dignity (*L'Estrange*).

To DEMI'T. *v. a.* (*demitto*, Lat.) To depress; to hang down; to let fall (*Brown*)

DEMIURGE. (from δημιος, which denotes a public servant, and εργον, work.) In the mythology of the eastern philosophers, was one of the Æons employed by the supreme Deity in the creation of the world. He had a compound character of shining virtues, and excessive arrogance and ambition.

DE'MOCRACY. *s.* (δημοκρατια.) A form of government, in which the sovereign power is lodged in the body of the people (*Temple*).

DEMOCRA'TICAL. *a.* (from *democracy*.) Pertaining to a popular government; popular (*Brown*).

DEMOCRITUS, a famous philosopher of antiquity. He was born at Abdera in Thrace, about 460 B.C. His father was a man of prodigious wealth, but Democritus preferred philosophy to riches, and spent the whole of his patrimony in travelling to acquire knowledge. There was a law in his country, that whoever reduced himself to poverty should be deprived of the rites of sepulture. Democritus had incurred this rigid sentence, but his talents were so greatly admired, that the magistrates decreed he should be buried at the public expence, and besides made him a liberal present. Some, however, charged him with insanity, and Hippocrates was sent for to cure him; but the physician made no scruple to say, that they who had sent for him were more mad than the patient. He is said to have put out his eyes that he might be able to philosophize the better; but this is not well-founded. He was constantly laughing at the follies of mankind, and therein differed from Heraclitus, who was always weeping for the same cause. He died at the age of 109, B.C. 361. None of his writings have come down to us. He was the author of the atomical philosophy, and the precursor of Epicurus. Pliny numbers him among those who had a knowledge of chemical and magical arts, which he learnt of the Egyptian priests.

DEMOIVRE (Abraham), an eminent mathematician, was born at Vitri in Champagne, May 1667. The revocation of the edict of Nantz, in 1685, determined him to fly into England, sooner than abandon the religion of his fathers. He laid the foundation of his mathematical studies in France, and perfected himself at London; where a mediocrity of fortune obliged him to employ his talents in this way, and to read public lectures for his better support. The Principia Mathematica of Newton, which chance is said to have thrown in his way, made him comprehend at once how little he had advanced in the science he professed. He fell hard to work: he succeeded as he went along; and he soon became connected with, and celebrated among, the first-rate mathematicians. His eminence and abilities soon opened to him an entrance into the Royal Society of London, and afterwards into the Academy of Sciences at Paris. His merit was so known and acknowledged by the former, that they judged him a fit person to decide the famous contest between Newton and Leibnitz. The collection of the Academy of Paris contains no memoir of this author, who died at London, Nov 1754, soon after his admission into it; but the Philosophical Transactions of London have several, and all of them interesting. He published also some capital works, such as, Miscellanea Analytica, de seriebus et quadraturis, &c. 1730, 4to. But, perhaps, he has been more generally known by his Doctrine of Chances, or, Method of calculating the Probabilities of Events at Play. This work was first printed, 1718, in 4to and dedicated to sir Isaac Newton: it was reprinted, 1738, with great alterations and improvements; and a third edition was afterwards published with additions, and a Treatise on Annuities, dedicated to lord Carpenter

To DEMO'LISH. *v. a.* (*demolir*, Fr.) To throw down buildings; to raze; to destroy (*Tillotson*).

DEMO'LISHER. *s.* (from *demolish.*) One that throws down buildings; a destroyer.

DEMOLI'TION. *s.* (from *demolish.*) The act of overthrowing buildings; destruction (*Swift*).

DE'MON. *s.* (*dæmon*, Lat.) A spirit; generally an evil spirit; a devil. See Dæmon.

DEMONI'ACAL. Demo'niack. *a.* (from *demon.*) 1. Belonging to the devil; devilish. (See Dæmoniac). 2. Influenced by the devil (*Milton*).

DEMO'NIACK. *s.* (from the adjective.) One possessed by the devil (*Bentley*).

DEMO'NIAN. *a* Devilish (*Milton*).

DEMONO'CRACY. *s.* (δαιμων and κρατεω.) The power of the devil.

DEMONO'LATRY. *s.* (δαιμων and λατρεια.) The worship of the devil.

DEMONO'LOGY. *s* (δαιμων and λογος.) Discourse of the nature of devils.

DEMO'NSTRABLE. *a.* (*demonstrabilis*, Lat.) That may be proved beyond doubt or contradiction; that may be made evident (*Glanville*).

DEMO'NSTRABLY. *ad.* In such a manner as admits of certain proof; evidently (*Clarendon*).

To DEMO'NSTRATE. *v. a.* (*demonstro*, Lat.) To prove with the highest degree of certainty (*Tillotson*).

DEMONSTRATION. *s.* (*demonstratio*, Lat.) 1. The highest degree of deducible or argumental evidence (*Hooker*). 2. Indubitable evidence of the senses or reason.

Demonstration, in logic, a syllogism in form containing a clear and irrefragable proof of the truth of a proposition.

A demonstration is a convincing argument, the two first propositions whereof are certain, clear, and evident; whence of necessity arises an infallible conclusion.

The method of demonstrating things in mathematics is the same with that of drawing conclusions from principles in logic. In effect, the demonstrations of mathematicians are no other than series of enthymemes; every thing is concluded by force of syllogism, only omitting the premises, which either occur of their own accord, or are recollected by means of quotations. To have the demonstration perfect, the premises of the syllogisms should be proved by new syllogisms, till at length you arrive at a syllogism, wherein the premises are either definitions, or identic propositions.

Indeed it might be demonstrated, that there cannot be a genuine demonstration, i. e. such a one as shall give full conviction, unless the thoughts be directed therein according to the rules of syllogism. Clavius, it is well known, resolved the demonstration of the first proposition of Euclid into syllogism: Herlinus, and Dasipodius, demonstrated the whole six first books of Euclid, and Henischus, all arithmetic, in the syllogistic form.

Yet people, and even mathematicians, usually imagine, that mathematical demonstrations are conducted in a manner far remote from the laws of syllogism; so far are they from allowing that those derive all their force and conviction from these. But we have men of the first rank on our side the question. M. Leibnitz, for instance, declares that demonstration to be firm and valid which is in the form prescribed by logic; and Dr. Wallis confesses, that what is proposed to be proved in mathematics is deduced by means of one or more syllogisms: the great Huygens, too, observes, that paralogisms frequently happen in mathematics, through want of observing the syllogistic form. See Syllogism.

Problems consist of three parts: a proposition, resolution, and demonstration.

In the proposition is indicated the thing to be done.

In the resolution, the several steps are orderly rehearsed, whereby the thing proposed is performed.

Lastly, in the demonstration it is shewed, that the things enjoined by the resolution being done, that which was required in the proposition is effected. As often, therefore, as a problem is to be demonstrated, it is converted into a theorem; the resolution being the hypothesis, and the proposition the thesis: for the general tenor of all problems to be demonstrated is this; that the thing prescribed in the resolution being performed, the thing required is done.

The schoolmen make two kinds of demonstration: the one τȣ διοτι, or *propter quod*; wherein an effect is proved by the next cause. As when it is proved, that the moon is eclipsed, because the earth is then between the sun and moon. The second τȣ οτι, or *quia*; wherein the cause is proved, from a remote effect: as when it is proved, that fire is hot, because it burns; or that plants do not breathe, because they are not animals; or that there is a God, from the works of creation. The former is called *demonstration à priori*, and the latter *demonstration à posteriori*.

Demonstration (Affirmative), is that which, proceeding by affirmative and evident propositions, dependent on each other, ends in the thing to be demonstrated.

Demonstration (Apagogical). See Apagogical.

Demonstration (Geometrical), is that framed of reasonings drawn from the elements of geometry.

Demonstration (Mechanical), is that, the reasonings whereof are drawn from the rules of mechanics.

Demonstration a priori, is that whereby an effect is proved from a cause, either a next, or remote one; or a conclusion proved by something previous, whether it be a cause, or only an antecedent.

Demonstration a posteriori, is that whereby either a cause is proved from an effect, or a conclusion is proved by something posterior; whether it be an effect, or only a consequent.

DEMO'NSTRATIVE. *a.* (*demonstrativus*, Latin.) 1. Having the power of demonstration; invincibly conclusive; certain (*Hooker*). 2. Having the power of expressing clearly (*Dryden*). 3. That which shows: as, *demonstrative* pronouns.

DEMO'NSTRATIVELY. *ad.* 1. With evidence not to be opposed or doubted (*South*). 2. Clearly, plainly; with certain knowledge (*Brown*)

DEMONSTRA'TOR. *s.* (from *demonstrate*.) One that proves; one that teaches.

DEMO'NSTRATORY. *a.* (from *demonstrate*.) Having the tendency to demonstrate.

DEMOSTHENES, the celebrated orator of Athens, was son of a rich blacksmith, called Demosthenes, and of Cleobule. He was but seven years of age when his father died, and his guardians having embezzled the greatest part of his possessions, his education was totally neglected; and for whatever advances he made in learning, he was indebted to his own industry and application. He became the pupil of Isæus and Plato, and applied himself to study the orations of Isocrates. At the age of 17, he gave an early proof of his eloquence and abilities against his guardians, from whom he obtained the retribution of the greatest part of his estate. His rising talents were, however, impeded by weak lungs, and a difficulty of pronunciation, especially of the letter *r*, but these obstacles were soon conquered by unwearied application. To correct the stammering of his voice, he spoke with pebbles in his mouth; and removed the distortion of his features, which accompanied his utterance, by watching the motions of his countenance in a looking-glass. That his pronunciation might be loud, and full of emphasis, he frequently ran up the steepest and most uneven walks, where his voice acquired force and energy; and on the sea-shore, when the waves were uncommonly agitated, he declaimed aloud, to accustom himself to the noise and tumults of a public assembly. He also confined himself in a subterraneous cave, to devote himself more closely to studious pursuits; and to eradicate all curiosity of appearing in public, he shaved one half of his head. His abilities, as an orator, raised him to consequence at Athens, and he was soon placed at the head of government. In this public capacity he roused his countrymen from their indolence, and animated them against the encroachment of Philip of Macedonia. In the battle of Cheronæa, however, Demosthenes betrayed his pusillanimity, and saved his life by flight. After the death of Philip, he declared himself warmly against his son and successor, Alexander. Though he had boasted that all the gold of Macedonia could not tempt him, yet he suffered himself to be bribed by a small golden cup from Harpalus. This forced him to retire to Egina, whence, when Antipater made war against Greece, he was recalled and received with much splendor at Athens. His triumph and popularity were but of short duration. Antipater and Craterus were near Athens, and demanded all the orators to be given up. Demosthenes, with all his adherents, fled to the temple of Neptune in Caluria; and when he saw that all hopes of safety were vanished, he took a dose of poison, which he always carried in a quill, and expired, in the 60th year of his age, B.C. 322.

Demosthenes has been deservedly called the prince of orators. Indeed no orator had ever a finer field than Demosthenes in his Olynthiacs and Philippics, which are his capital orations; and undoubtedly to the greatness of the subject, and to that integrity and public spirit which breathe in them, they owe a large portion of their merit. Cicero calls him a perfect model, and such as he himself wished to be. These two great orators have been often compared together; but the judgment hesitates to which to give the preference. The archbishop of Cambray, however, seems to have stated their merits with great justice and perspicuity in his Reflections on Rhetoric and Poetry. The passage, translated, is as follows: "I do not hesitate to declare that I think Demosthenes superior to Cicero. I am persuaded no one can admire Cicero more than I do. He adorns whatever he attempts. He does honour to language. He disposes of words in a manner peculiar to himself. His style has great variety of character. Whenever he pleases, he is even concise and vehement; for instance, against Catiline, against Verres, against Antony. But ornament is too visible in his writings. His art is wonderful, but it is perceived. When the orator is providing for the safety of the republic, he forgets not himself, nor permits others to forget him. Demosthenes seems to escape from himself, and to see nothing but his country. He seeks not elegance of expression; unsought for he possesses it. He is superior to admiration. He makes use of language, as a modest man does of dress, only to cover him. He thunders, he lightens. He is a torrent which carries every thing before it. We cannot criticise, because we are not ourselves. His subject enchains our attention, and makes us forget his language. We lose him from our sight: Philip alone occupies our minds. I am delighted with both these orators; but I confess that I am less affected by the infinite art and magnificent eloquence of Cicero, than by the rapid simplicity of Demosthenes." La Harpe, also, has some fine remarks on the different kinds of eloquence of Cicero and Demosthenes, and their comparative fitness for the audiences they had respectively to address: but they are too long to be transcribed into this place.

Demosthenes is said to have composed 65 orations, of which only a few have reached our times. Among the best editions of these, are that of Frankfort, 1604, folio, with Wolfius's Latin version; of Reiske, 12 vols. 8vo. Leips. 1770; of Auger, 4to. Paris, 1790. Of the select orations the best edition is by Mounteney. Cant. 1731. Lond. Oct. 1785. The curious in bibliography are very eager to obtain the genuine editio princeps of Demosthenes, which is by Aldus, Venet. fol. 1504.

DEMU'LCENT. *a.* (*demulcens,* Latin.) Softening; mollifying; assuasive (*Arbuthnot*).

DEMU'LCENTS. (*demulcentia, medicamenta*; from *demulceo,* to soften). Medicines are thus called, which possess a power of diminishing the effects of stimuli on the sensible solids of the body. There are two orders of demulcents: 1. Lenient demulcents, as starch, gum arabic, and olive oil: these are best adapted to irritable constitutions, and persons with a remarkable disposition to have their secretions morbidly augmented. 2. Diluent demulcents, as water and watery substances: these are calculated for such as have a diminution of the secretions, and whose habits are naturally torpid.

To DEMU'R. *v. n.* (*demeurer,* French.) 1. To delay a process in law by doubts and objections (*Walton*). 2. To pause in uncertainty; to suspend determination (*Hayward*). 3. To doubt; to have scruples (*Bentley*).

To Demu'r. *v. a.* To doubt of (*Milton*).

Demu'r. *s.* (from the verb.) Doubt; hesitation; suspense of opinion (*South*).

DEMU'RE. *a.* (*des mœurs,* French.) 1. Sober; decent (*Spenser*). 2. Grave; affectedly modest (*Swift*).

To Demu're. *v. n.* (from the noun.) To look with an affected modesty (*Shakspeare*).

DEMU'RELY. *ad.* (from *demure.*) 1. With affected modesty; solemnly (*Bacon*). 2. Solemnly (*Shakspeare*).

DEMU'RENESS. *s.* (from *demure.*) 1.

Modesty, soberness; gravity of aspect. 2. Affected modesty; pretended gravity.

DEMU'RRAGE. *s.* (from *demur.*) An allowance made to masters of ships, for their stay in a port beyond the time appointed.

DEMURRER, in law, a stop put to any action upon some point of difficulty which must be determined by the court, before any further proceedings can be had in the suit.

DEMURRER TO EVIDENCE, is where a question of law arises thereon; as if the plantiff in a suit gives in evidence any records, deeds, writings, &c. upon which a law-question arises, and the defendant offers to demur upon it, then the plaintiff must join in such demurrer, or wave his evidence.

DEMURRER TO INDICTMENTS, is when a criminal joins issue upon a point of law in an indictment or appeal, allowing the fact as laid to be true.

DEN. *s.* (ꝺen, Saxon.) 1. A cavern or hollow running with a small obliquity under ground (*Hooker*). 2. The cave of a wild beast (*Dryden*). 3. *Den*, in a local name, may signify either a valley or a woody place (*Gibson*).

DENARIUS, in Roman antiquity, the chief silver coin among the Romans, worth in our money about sevenpence three farthings. As a weight, it was the seventh part of a Roman ounce. In our law-books, an English penny is often called Denarius.

DENA'Y. *s.* Denial; refusal (*Shakspeare*).

DENBIGH, a town of North Wales, the capital of the county of the same name. It stands on the side of a rocky hill, on a branch of the river Clwyd; and is called by the Welsh Cledvyrn yn Rhos, i. e. The craggy hill in Ross. Denbigh contains 552 houses, and 2391 inhabitants: it sends one member to the British parliament, and has a market on Wednesdays. Lat. 53. 11 N. Lon. 3. 35 W.

DENBIGHSHIRE, a county of Wales, bounded on the south by Merioneth and Montgomery shires, on the north by Flintshire and the Irish sea, on the west by Caernarvon and part of Merionethshire. It is about 40 miles long and 21 broad. The air is wholesome, but sharp, the country being pretty hilly, and the snow lying long on the tops of the mountains. The soil in general is barren: but the vale of Clwyd, so called, from its being watered by that river, is a very fertile pleasant spot of great extent, and well inhabited. The county contains about 410,000 acres of land, 13,048 houses, and 60,352 inhabitants. They send one member to parliament, besides one for the county town.

DENDERA, the ancient Tentyris or Tentyra, a town or large village of Egypt, built near the ruins of the ancient city at a short distance from the west bank of the Nile, about 242 miles S. of Cairo. Some of the ruins near this place are very magnificent. Lat. 26. 10 N. Lon. 31. 40 E.

DENDERMOND, a strong town of Flanders, in the Austrian Netherlands. Lat. 51. 2 N. Lon. 4. 10 E.

DENDRITES, or ARBORIZATIONS. This appellation is given to figures of vegetables which are frequently observed in fossil substances. They are of two kinds; the one superficial, the other internal. The first are chiefly found on the surface of stones, and between the strata and in the fissures of those of a calcareous nature. Stones of a similar kind, when very compact, sometimes also exhibit internal arborizations; such are the marbles of Hesse, of Angersburg in Prussia, and of Baden-Dourlach on the left bank of the Rhine.

DENDROBIUM, in botany, a genus of the class gynandria, order monandria. Calyx (in some species reversed) three-leaved, oblong, somewhat spreading; the two lowermost leaves extended at the base, on their underside, and cohering so as to form a pouch, bearing some resemblance to a spur: petals two, oblong, lateral; nectary a lip of various shapes in different species, its base included in and often connected with the pouch of the calyx, destitute of a spur; capsule oblong or ovate, with three or six angles or ribs, one cell and three valves, bursting between the ribs; seeds numerous, minute, each clothed with a chaffy tunic. Thirty-two species; natives of the East or West Indies; resembling the orchis tribe, and growing parasitically for the most part on the trunks or branches of old trees.

DENDRO'LOGY. *s.* (δενδρον and λογος.) The natural history of trees.

DENDROMETER, (from δενδρον, a tree, and μετρεω, I measure), an instrument for measuring trees. The same name has also been applied, though with no propriety, to instruments contrived to measure distances and magnitudes from a single station.

DENDROPHORIA, in antiquity, the carrying of one, or more, trees, in ceremony, through a city, at certain feasts, and in honour of certain deities. The persons who performed the office of carrying the trees were called dendrophori, i. e tree-bearers.

DENEB, an Arabic term, signifying tail, used by astronomers as a name to some of the fixed stars: as, Deneb Alesed, Lion's-tail; Deneb Kaitos, the Whale's-tail. See CAUDA.

DENEHIA, in botany, a genus of the class syngenesia, order polygamia superflua. Receptacle naked; downless; calyx imbriate; florets of the ray two lipped. One species only; a Cape plant, with striate, downy branched stem; leaves half clasping, oblong-lanceolate, obtuse with a point undulate; downy underneath, entire; flowers terminal in a close panicle.

DENHAM (Sir John), an eminent English poet, the only son of sir John Denham, chief baron of the exchequer in Ireland, and one of the lords commissioners there, was born in Dublin in 1615; but his father, in 1617, being made a baron of the exchequer in England, he received his education in this country. In his youth he followed gaming more than any thing else; but, in 1641, published a tragedy called the Sophy, which was much admired by the best judges; and, in 1643, wrote his famous poem called Cooper's Hill, which Mr. Dryden pronounces will ever be the standard of good writing for majesty of style. The lines which have excited the most attention are the following in a description of the river Thames:

> "O could I flow like thee, and make thy stream
> My great example—as it is my theme!
> Tho' deep, yet clear; tho' gentle, yet not dull;
> Strong without rage; without o'erflowing, full."

Of these lines Dr. Johnson says: "So much meaning is confined in so few words; the particulars of resemblance are so perspicaciously collected, and every mode of excellence separated from its adjacent fault, by so nice a line of limitation; the different parts of the sentence are so accurately adjusted, and the flow of the last couplet is so smooth and sweet, that the passage, however celebrated, has not been praised above its merit. It has beauty peculiar to itself, and must be numbered among those felicities which cannot be produced at will by wit and labour, but must rise unexpectedly in some hour propitious to poetry." Denham was sent ambassador from Charles II. to the king of Poland; and at the restoration was made surveyor-general of his majesty's buildings, and created knight of the Bath. On obtaining this post, he is said to have renounced his poetry for more important studies; though he afterwards wrote a fine copy of verses on the death of Cowley. He died at his office in Whitehall in 1668; and his works have been often since printed.

DENI'ABLE. *a.* (from *deny.*) That may be denied (*Brown*).

DENI'AL. *s.* (from *deny.*) 1. Negation; the contrary to confession (*Sidney*). 2. Refusal; the contrary to grant (*Shakspeare*). 3. Abjuration; contrary to acknowledgment of adherence (*South*).

DENI'ER. *s.* (from *deny.*) 1. A contradictor; an opponent (*Watts*). 2. A disowner; one that does not own or acknowledge (*South*). 3. A refuser; one that refuses (*K. Charles*).

Denier, a small French copper coin, of which twelve make a sol. There are two kinds of deniers, the one tournois, the other parisis, whereof the latter is worth a fourth part more than the former. See **Money**.

To DE'NIGRATE. *v. a.* (*denigro*, Latin.) To blacken; to make black (*Boyle*).

DENIGRA'TION. *s.* (*denigratio*, Latin.) A blackening, or making black (*Boyle*).

DENIZA'TION. *s.* (from *denizen.*) The act of enfranchising, or making free (*Davies*).

DE'NIZEN. De'nison. *s.* (*dinasddyn*, Welsh, a man of the city.) A freeman; one enfranchised (*Davies*).

To De'nizen. *v. a.* (from the noun.) To enfranchise; to make free (*Donne*).

DENMARK, a kingdom of Europe, bounded on the E. by the Baltic sea, on the W. and N. by the ocean, and on the S. by Germany. The country is generally flat, and the soil a barren sand. The air is rendered foggy by the neighbourhood of the seas and lakes, of which it is full. Denmark, properly so called, consists of Jutland and the islands of Zealand and Funen, with the little isles about them; but the king of Denmark's dominions contain the kingdom of Norway, and the duchies of Holstein, Oldenburgh, and Delmenhorst. There is no considerable river, and the winter continues seven or eight months. In the summer the heat is very great, and the days are long. The commodities are corn, pulse, horses, and large beeves. The kingdom of Denmark was formerly limited and elective; but in 1660, it was made absolute and hereditary. This was the consequence of a revolution almost unparalleled in history; a free people voluntarily resigning their liberties into the hands of their sovereign. The inhabitants are Protestants since the year 1522, when they embraced the confession of Augsburg. The forces which the king of Denmark has usually on foot are near 40,000. The revenues are computed at 500,000l. a year, which arise from the crown lands and duties. The produce of Norway consists in pitch, tar, fish, oil, and deal boards. Copenhagen is the capital.

DENNIS (John), an English critic, born in London in 1657. He received his education at Cambridge, where he took his degree of B.A. but was expelled the university for attempting to assassinate a person in the dark. He then went abroad, and on his return set up as a gentleman and man of wit. In 1692 he wrote a pindaric ode on king William, after which he published several other poems, two of which, on the battles of Blenheim and Ramilies, procured him the favour of the duke of Marlborough, who gave him 100l. and procured him a place in the custom-house. In 1704 appeared his play called Liberty asserted; in which were so many strokes against the French nation, that he conceived that no negociation for peace would take effect unless he was delivered up; and he went so far as to desire the duke of Marlborough to use his interest in his behalf, but his grace encouraged him by saying, that "he had made no provision for himself, and yet he could not help thinking that he had done the French almost as much mischief as Mr. Dennis." In 1713 he attacked Mr. Addison's Cato, which occasioned a whimsical pamphlet, called, The Narrative of Dr. Robert Norris, concerning the strange and deplorable Frenzy of Mr. John Dennis. The critique on Cato, however, is by no means devoid of merit; it displays a considerable knowledge of the philosophy of the human mind, and has many strokes of fine satire; but a good deal of it seems written with a pen dipt in gall.

Mr. Dennis certainly was possessed of much erudition, and a considerable share of genius. In prose, he is far from a bad writer, where abuse or personal scurrility does not mingle itself with his language. In verse, he is extremely unequal, his numbers being at some times spirited and harmonious, and his subjects elevated and judicious; and at others, flat, harsh, and puerile.—As a dramatic author, he deserves not to be held in any consideration. It was justly said of him by a wit, that he was the most complete instructor for a dramatic poet, since he could teach him to distinguish good plays by his *precepts*, and bad ones by his *examples*.

DENO'MINABLE. *a.* (*denomino*, Latin.) That may be named or denoted (*Brown*).

To DENO'MINATE. *v. a.* (*denomino*, Latin.) To name; to give a name to (*Hammond*).

DENOMINA'TION. *s.* (*denominatio*, Latin.) A name given to a thing (*Rogers*).

DENO'MINATIVE. *a.* (from *denominate*.) 1. That gives a name; that confers a distinct appellation. 2. That obtains a distinct appellation (*Cocker*).

DENOMINA'TOR. *s.* (from *denominate*.) The giver of a name (*Brown*).

Denominator of a fraction, is the number below the line, shewing the nature and quality of the parts which any integer is supposed to be divided into. Thus, in the fraction $\frac{7}{8}$, the denominator is 8, and shews that the integer is divided into 8 parts, of which the fraction contains 7.

Denominator of a ratio, is sometimes used in the sense of the exponent of a ratio.

DENOTA'TION. *s.* (*denotatio*, Lat.) The act of denoting.

To DENO'TE. *v. a.* (*denoto*, Latin.) To mark; to be a sign of; to betoken; to show by signs.

To DENOU'NCE. *v. a.* (*denuncio*, Latin.) 1. To threaten by proclamation (*Milton*). 2. To threaten by some outward sign or expression (*Dryden*). 3. To give information against (*Ayliffe*).

DENOU'NCEMENT. *s.* (from *denounce*.) The act of proclaiming any menace (*Brown*).

DENOU'NCER. *s.* (from *denounce*.) One that declares some menace (*Dryden*).

DENS. (*dens, quasi edens*; from *edo*, to eat, or from οδυς, οδοντος.) A tooth. Many herbs have this specific name, from their fancied resemblance to the tooth of some animal; as *dens leonis*, the dandelion; *dens canis*, dog's tooth, &c.

Dens leonis. See Taraxacum.

DENSE. *a.* (*densus*, Lat.) Close; compact; approaching to solidity (*Locke*).

Dense panicle, in botany. Densa panicula. Having abundance of flowers very close. A greater degree of congesta, heaped.

DENSITY, (from the Latin *densitas*), strictly speaking, denotes vicinity or closeness of particles. But in mechanical science it is used as a term of comparison, expressing the proportion of the number of equal moleculæ, or the quantity of matter in one body, to the number of equal moleculæ in the same bulk of another body: density, therefore, is directly as the quantity of matter, and inversely as the magnitude of the body.

Since it may be shewn experimentally that the quantity of matter in different bodies is proportional to their weight, of consequence, the density of any body is directly as its weight, and inversely as its magnitude: or, the inverse ratio of the magnitudes of two bodies, having experimentally equal weights (in the same place) constitutes the ratio of their densities.

Density of the air. See Air, Atmosphere, and Pneumatics.

Density of the planets. See Astronomy, § viii.

DENTAGRA. (*dentagra*.) The tooth-ach: also an instrument for drawing the teeth.

DE'NTAL. *a.* (*dentalis*, Latin.) 1. Belonging or relating to the teeth. 2. (In grammar.) Pronounced principally by the agency of the teeth (*Holder*).

DENTALIUM. Tooth-shell. In zoology, a genus of the class vermes, order testacea. Animal a terebella; shell univalve, tubular, straight or slightly curved, with an undivided cavity open at both ends. Twenty-two species; mostly inhabiting the seas of Europe and India; two of them found on our own coasts; and about five or six known only from fossile specimens. The shell is commonly white or green; and either ribbed, striated, or dotted: those on our own coast are:

1. D. Entalis, with a white shell, reddish or pale yellow, polished with striæ so very minute as scarcely to be visible without a glass.

2. D. imperforatum. Found at Sandwich. Minute; shell white; opake, transversely striate, imperforate. Still inferior in size, however, is

3. D. minutum, with a round straitish smooth cell; inhabiting the Mediterranean: but so diminutive as not to be discerned by the naked eye; and resembling a small bristle on one of the spines of the echines. See Nat. Hist. Pl. LXXVII.

DENTARIA. Tooth-wort. In botany, a genus of the class tetradynamia, order siliquosa; silique bursting elastically, with the valves revolute and shorter than the partition; stigma notched at the end; calyx leaves meeting longitudinally. Seven species; all European plants, and one, d. bullifera, found in the retired shady parts of our own fields with its lower leaves pinnate, its upper simple. This plant is to be distinguished from the pellitory of Spain, which is also called dentaria. It is the plumbago europæa; foliis amplexicaulibus, lanceolatis scabris, of Linnéus. The root was formerly esteemed, prepared in a variety of ways, as a cure for the tooth-ache, arising from caries.

DENTATE LEAF. In botany. A toothed leaf. Quod acumina horizontalia, folii consistentia, spatio remota habet. Having horizontal points of the same consistence with the leaf, with a space between each. Dr. Berkenhout observes, that if, instead of horizontal, Linnéus had written, in the plane of the disk, it would have been more intelligible. In Delin. Pl. it is; margine acuminibus patentibus remotis; having spreading points (or teeth), remote from each other, about the edge. Exemplified in leontodon hastile, autumnale, alpinum, hispidum, hirtum. Primula veris et minima. Epilobium montanum.

DENTATE ROOT. A toothed root. Consisting of a concatenation of joints, resembling a necklace

DENTATE SINUATE. Toothed, and at the same time with sinuses, bays or large hollows about the edge. Tooth sinuate.

DENTATUS. (*dentatus*; from *dens*, a tooth, from its tooth-like process.) Dentata. Epistrophæus. The second vertebra of the neck. It differs from the other cervical vertebræ, by having a tooth-like process at the upper part of the body.

DENTED. *a.* Indented, toothed.

DENTELLA. In botany, a genus of the class pentandria, order monogynia. Calyx five-parted, superior; corol funnel-form, five-cleft; the segments three-toothed; capsule globular, two-celled, many seeded; stigmas two. One species only; a native of New Caledonia; with filiform stem rooting at each joint; leaves opposite lanceolate, very entire; flowers axillary, solitary.

DENTALLARIA. See PLUMBAGO.

DENTES LACTEI. The milk teeth. See TEETH, and DENTITION.

DENTICLES, or DENTILS, in architecture, an ornament in corniches, bearing some resemblance to teeth; particularly affected in the Ionic and Corinthian orders; and of late also in the Doric. They are cut on a little square member, properly called denticulus; and the notches, or ornaments themselves, dentils, from *dens*, tooth. Vitruvius prescribes the breadth of each dentil, or tooth, to be half its height; and the metopa, or interval between each two, he orders to be two-thirds of the breadth of the dentil.

DENTICULATE, in botany. (*denticulus*, from *dens*.) Toothletted, having small teeth or notches. Applied to the leaf; as in hesperis matronalis, leontodon taraxacum, epilobium tetragonum. Applied to the calyx; and to the seed; as in bidens.

DENTI'CULATED. *a.* (*denticulatus*, Latin.) Set with small teeth.

DENTICULATION. *s.* (*denticulatus*, Latin.) The state of being set with small teeth (*Grew*).

DENTIFRICE. (*dentifricium*, from *dens*, a tooth, and *frico*, to rub). A medicine to clean the teeth.

Various are the compositions sold for the purpose of keeping the teeth in good preservation; they are mostly composed of earthy substances, finely powdered, and mixed with alum. Acids, though very effectual for cleansing the teeth, are decidedly mischievous. Charcoal is at present in high reputation as a dentifrice; but the sepia or cuttle-fish, sold by the chemists and finely powdered, and which is picked up on the sands of the southern coast, is much valued for this purpose.

DENTILLARIA. (from *dentella*, a little tooth: so called, because its root is denticulated.) See DENTARIA.

To DENTI'SE. *v. a.* (*denteler*, French.) To have the teeth renewed (*Bacon*).

DENTIST. *s.* (French.) One who confines himself to the extraction of teeth, and to the various operations required by their defects, redundancies, accidents, or disorders.

DENTITION. (*dentitio*, from *dentis*, to breed teeth). The breeding or cutting of the teeth. The first dentition takes place about the sixth or seventh month, and the teeth are termed the primary or milk teeth. About the seventh year these fall out, and are succeeded by others, which remain during life, and are called the secondary or perennial teeth. The last dentition takes place between the ages of twenty and five-and-twenty, when the four last grinders appear; they are called dentes sapientiæ.

The process and economy of teething in different animals, and in different stages in the life of the same animal, is a very important branch of natural history, more especially as a variation in the number, structure, and disposition of the teeth, has been selected by Linnéus as the grand characteristic distinction between the various orders of the mammal class of animals; and as various diseases are often generated in young animals, and especially in infants, during their production. The term *dentition*, indeed, is usually limited to a consideration of the growth of the teeth in connexion with these diseases alone; and, on this explanation of the term, *dentition* is a mere branch of the general subject of *odontology*. We have no desire to innovate upon received opinions, or to strain words in common use to a sense which does not belong to them in common language. On this account we have preferred the term *odontology* to that of *dentition*, as the head-piece of an article that ought to embrace in one comprehensive and systematic view whatever appertains to the history, physiology and pathology of the teeth, and shall refer our readers to the article ODONTOLOGY accordingly.

DENUDATÆ. (*denudor*, to be stripped naked.) The seventh of the natural orders, in Linnéus's Philos. Bot. comprehending a few genera which have flowers that appear at a different time from the leaves, and therefore have a naked appearance; as colchicum.

To DENU'DATE. *v. a.* (*denudo*, Lat.) To divest; to strip; to make naked (*D. of Piety*).

DENUDATION. *s.* (from *denudate.*) The act of stripping, or making naked.

To DENU'DE. *v. a.* (*denudo*, Latin.) To strip; to make naked; to divest (*Clarendon*).

DENUNCIATION. *s.* (*denunciatio*, Lat.) The act of denouncing; the proclamation of a threat; a public menace (*Ward*).

DENUNCIA'TOR. *s.* (from *denuncio*, Latin.) 1. He that proclaims any threat. 2. He that lays an information against another (*Ayliffe*).

To DENY. *v. a.* (*denier*, French.) 1. To contradict; not to confess (*Genesis*). 2. To refuse; not to grant (*Dryden*). 3 To abnegate; to disown (*Joshua*). 4. To renounce; to disregard (*Spratt*).

DENYS (St.), a town of France, in the department of Paris. Here is an ancient and magnificent church, in which were the tombs of many of the French kings. In 1793, after the abolition of royalty, these tombs were all destroyed, and the name of the town was changed to that of Franciade! Lat. 48. 56 N. Lon. 2. 26 E.

To **DEOBSTRU'CT.** *v.a.* (*deobstruo*, Lat.) To clear from impediments (*More*).

DEOBSTRUENTS. (*deobstruentia, medicamenta*; from *de*, and *obstruo*, to obstruct). Medicines that are exhibited with a view of removing any obstruction.

DEODAND, in our customs, a thing given, or forfeited, as it were to God, for the pacification of his wrath in a case of misadventure, whereby a man or woman comes to a violent end, without the fault of any reasonable creature: thus, if a horse should kill his keeper; he was to be sold and the price distributed to the poor, as an expiation of that fatal event.

To **DEO'PPILATE.** *v. a.* (*de* and *oppilo*, Latin.) To deobstruct; to clear a passage.

DEOPPILA'TION. *s.* (from *deoppilate.*) The act of clearing obstructions (*Brown*).

DEO'PPILATIVE. *a.* (from *deoppilate.*) Deobstruent (*Harvey*).

DEOSCULA'TION. *s.* (*deosculatio*, Lat.) The act of kissing (*Stillingfleet*).

To **DEPA'INT.** *v. a.* (*depeint*, French.) 1. To picture; to describe by colours (*Spenser*). 2. To describe (*Gay*).

To **DEPA'RT.** *v. n.* (*depart*, French.) 1. To go away from a place (*Susanna*). 2. To desist from a practice (*Kings*). 3. To be lost; to perish (*Esdras*). 4. To desert; to revolt; to fall away; to apostatize (*Isaiah*). 5. To desist from a resolution or opinion (*Clarendon*). 6. To die; to leave the world (*Luke*).

To Depa'rt. *v. a.* To quit; to leave; to retire from: not in use (*Ben Jonson*).

To Depa'rt. *v. a.* (*partir*, French.) To divide; to separate: a chemical term.

Depa'rt. *s.* (*depart*, French.) 1. The act of going away (*Shakspeare*). 2. Death (*Shakspeare*). 3. (With chemists.) An operation so named, because the particles of silver are *departed* or divided from gold.

DEPA'RTER. *s.* (from *depart.*) One that refines metals by separation.

DEPA'RTMENT. *s.* (*departement*, Fr.) Separate allotment; province or business assigned to a particular person (*Arbuthnot*).

Department, in geography, one of the districts or distinct provinces into which France was divided by the National Assembly, A.D. 1790, afterwards in 1795, and finally established in the 8th year of the republic. Those of Corsica, the Elbe, and Piedmont, were afterwards added; and the whole number of departments amounts to 109. See Ain, Alps, &c.

DEPA'RTURE. *s.* (from *depart.*) 1. A going away (*Addison*). 2. Death; decease, the act of leaving the present state of existence (*Sidney*). 3. A forsaking; an abandoning (*Tillotson*).

Departure, in navigation, is the easting or westing of a ship in respect of the meridian it departed or sailed from: or it is the difference of longitude, either east or west, between the present meridian the ship is under, and that where the last reckoning or observation was made. This departure, any where but under the equator, must be accounted according to the number of miles in a degree, proper to the parallel the ship is under.

DEPA'SCENT. *a.* (*depascens*, Latin.) Feeding.

To **DEPA'STURE.** *v. a.* (from *depascor*, Latin.) To eat up; to consume by feeding upon it (*Spenser*).

To **DEPA'UPERATE.** *v. a.* (*depaupero*, Latin.) To make poor; to impoverish (*Arbuthnot*).

DEPE'CTIBLE. *a.* (from *depecto*, Latin.) Tough; clammy; tenacious (*Bacon*).

To **DEPE'INCT.** *v. a.* (*depeindre*, Fr.) To depaint; to describe in colours (*Spenser*).

To **DEPE'ND.** *v. n.* (*dependeo*, Latin.) 1. To hang from (*Dryden*). 2. To be in a state influenced by some external cause (*Bacon*). 3. To be in a state of dependance (*Shakspeare*). 4. To be connected with any thing (*Rogers*). 5. To be in suspense (*Bacon*). 6. *To* Depend *upon.* To rely on; to trust to; to be certain of (*Clarendon*).

DEPE'NDANCE. Depe'ndancy. *s.* (from *depend.*) 1. The state of hanging down from a supporter. 2. Something hanging upon another (*Dryden*). 3. Concatenation; connexion; relation of one thing to another (*Locke*). 4. State of being at the disposal or under the sovereignty of another (*Tillotson*). 5. The things or persons of which any man has the dominion or disposal (*Bacon*). 6. Reliance; trust; confidence (*Hooker*).

DEPE'NDANT. *a.* (from *depend.*) In the power of another (*Hooker*).

Depe'ndant. *s.* (from *depend.*) One who lives in subjection, or at the discretion of another; a retainer (*Clarendon*).

DEPE'NDENCE. Depe'ndency. *s.* (from *dependeo*, Latin.) 1. A thing or person at the disposal or discretion of another (*Collier*). 2. State of being subordinate, or subject (*Ba.*). 3. That which is not principal; that which is subordinate (*Burnet*). 4. Concatenation; connexion (*Shakspeare*). 5. Relation of any thing to another (*Burnet*). 6. Trust; reliance; confidence (*Stillingfleet*).

DEPE'NDENT. *a.* (*dependens*, Latin.) Hanging down (*Peacham*).

Dependent leaf, in botany, a leaf hanging down; or pointing directly to the ground. Applied also to the sleep of plants; when the leaves, which are erect in the day, hang down at night.

Depe'ndent. *s.* (from *dependens*, Latin.) One subordinate (*Rogers*).

DEPE'NDER. *s.* (from *depend.*) One that reposes on the kindness of another (*Shak.*).

DEPERDI'TION. *s.* (from *deperditus*, Latin.) Loss; destruction (*Brown*).

DEPESTA, in antiquity, a wine vessel which the Sabines set on the table of their gods, at a festival.

DEPHLEGMATION, in chemistry, the depriving any liquid of part of the superfluous water which it may contain, whence it has in one respect the effect of concentration. Thus sulphuric acid is dephlegmated by boiling for a time, which expels at first little else than mere water. Vinegar is dephlegmated by partial freezing, the ice that first forms being only the watery portion containing none of the acid.

To DEPHLE'GM. *To* Dephle'gmate. *v. a.* (*dephlegmo*, low Latin.) To clear from phlegm, or aqueous insipid matter (*Boyle*).

DEPHLE'GMEDNESS. (from *dephlegm.*) The quality of being freed from phlegm (*Boyle*).

DEPHLOGISTICATED AIR. See Oxygen.

Dephlogisticated marine acid. See Acid and Oxymuriatic acid.

Dephlogisticated nitrous air. See Nitrous oxyd.

To DEPI'CT. *v. a.* (*depingo, depictum*, Latin.) 1. To paint; to portray (*Taylor*). 2. To describe; to represent an action to the mind (*Felton*).

DEPI'LATORY. *s.* (*de* and *pilus*, Latin.) An application used to take away hair.

DEPI'LOUS. *a.* (*de* and *pilus*, Lat.) Without hair (*Brown*).

DEPLANTA'TION. *s.* (*deplanto*, Latin.) The act of taking plants up from the bed.

DEPLE'TION. *s.* (*depleo, depletus*, Lat.) The act of emptying (*Arbuthnot*).

DEPLO'RABLE. *s.* (from *deploro*, Latin.) 1. Lamentable; dismal; sad; calamitous; miserable; hopeless (*Clarendon*). 2. Contemptible; despicable: as, *deplorable* nonsense.

DEPLO'RABLENESS. *s.* (from *deplorable.*) The state of being deplorable; misery.

DEPLO'RABLY. *ad.* (from *deplorable.*) Lamentably; miserably (*South*).

DEPLO'RATE. *a.* (*deploratus*, Latin.) Lamentable; hopeless (*L'Estrange*).

DEPLORA'TION. *s.* (from *deplore.*) The act of deploring, or of lamenting.

To DEPLO'RE. *v. a.* (*deploro*, Latin.) To lament; to bewail; to mourn (*Dryden*).

DEPLO'RER. *s.* (from *deplore.*) A lamenter; a mourner.

DEPLUMA'TION. *s.* (*deplumatio*, Latin.) 1. A pluming, or plucking off the feathers. 2. (In surgery.) A swelling of the eyelids, accompanied with the fall of the hairs from the eyebrows (*Phillips*).

To DEPLU'ME. *v. a.* (*de* and *plumo*, Lat.) To strip of its feathers.

To DEPO'NE. *v. a.* (*depono*, Latin.) 1. To lay down as a pledge or security. 2. To risk upon the success of an adventure (*Hudibras*)

DEPO'NENT. *s.* (from *depono*, Latin.) 1. One that deposes his testimony in a court of justice; an evidence; a witness. 2. (In grammar.) Such verbs as have no active voice are called *deponents* (*Clarke*).

To DEPO'PULATE. *v. a.* (*depopulor*, Latin.) To unpeople; to make waste (*Bacon*).

DEPOPULA'TION. *s.* (from *depopulate.*) The act of unpeopling; havock; waste (*Milt.*).

DEPOPULA'TOR. *s.* (from *depopulate.*) A dispeopler; a destroyer of mankind.

To DEPO'RT. *v. a.* (*deporter*, French.) To carry; to demean; to behave (*Pope*).

Depo'rt. *s.* (from the verb.) Demeanour; behaviour (*Milton*).

DEPORTA'TION. *s.* (*deportatio*, Latin.) 1. Transportation; exile into a remote part of the dominion. 2. Exile in general (*Ayliffe*).

DEPO'RTMENT. *s.* (*deportment*, French.) 1. Conduct; management (*Wotton*). 2. Demeanour; behaviour (*Swift*).

To DEPO'SE. *v. a.* (*depono*, Latin.) 1. To lay down; to lodge; to let fall (*Woodward*). 2. To degrade from a high station (*Dryden*). 3. To take away; to divest (*Shakspeare*). 4. To give testimony; to attest (*Bacon*). 5. To examine any one on his oath (*Shakspeare*).

To Depo'se. *v. n.* To bear witness (*Sidney*).

DEPO'SITARY. *s.* (*depositarius*, Latin.) One with whom any thing is lodged in trust (*Shakspeare*).

To DEPO'SITE. *v. a.* (*depositum*, Latin.) 1. To lay up; to lodge in any place (*Bentley*). 2. To lay up as a pledge, or security. 3. To place at interest (*Spratt*). 4. To lay aside (*D. of Piety*).

Depo'site. *s.* (*depositum*, Latin.) 1. Any thing committed to the trust and care of another. 2. A pledge; a thing given as a security. 3. The state of a thing pledged (*Bac.*).

DEPOSI'TION. *s.* 1. The act of giving publick testimony. 2. The act of degrading one from dignity.

Deposition, in law, the testimony given in court by a witness upon oath. In chancery, deposition is a testimony set down in writing, by way of answer to the interrogations exhibited in chancery, where such witness is called deponent. Depositions in one cause may be used at the hearing of another, where they are between the same parties, &c. without any motion: this is not permitted in other courts, without a special order of the court of chancery. The depositions in chancery, after the cause is determined there, may be given in evidence in a trial at bar, in any of the other courts.

DEPO'SITORY. *s.* (from *deposit.*) The place where any thing is lodged (*Addison*).

DEPOT, a term which is now anglicised, and employed to denote a deposit or reserve for stores, provisions, &c.: it is principally used in a military sense.

DEPRAVA'TION. *s.* (*depravatio*, Latin.) 1. The act of making any thing bad (*Swift*). 2. Degeneracy; depravity (*South*). 3. Defamation: not in use (*Shakspeare*).

To DEPRA'VE. *v. a.* (*depravo*, Latin.) To vitiate; to corrupt; to contaminate (*Hooker*)

DEPRA'VEDNESS. *s.* (from *deprave.*) Corruption; taint; vitiated state (*Hammond*).

DEPRA'VEMENT. *s.* (from *deprave.*) A vitiated state; corruption (*Brown*).

DEPRA'VER. *s.* (from *deprave.*) A corrupter.

DEPRA'VITY. *s.* (from *deprave.*) Corruption.

To **DE'PRECATE.** *v. a.* 1. To beg off; to pray deliverance from (*Smal.*). 2. To implore mercy of: not proper (*Prior*).

DEPRECA'TION. *s.* (*deprecatio*, Latin.) Prayer against evil (*Brown*).

DE'PRECATIVE. DE'PRECATORY. *a.* (from *deprecate.*) That serves to deprecate; apologetick (*Bacon*).

DEPRECA'TOR. *s.* (*deprecator*, Latin.) One that averts evil by petition.

To **DEPRE'CIATE.** *v. a.* (*depretiare*, Latin.) 1. To bring a thing down to a lower price. 2. To undervalue (*Addison*).

To **DE'PREDATE.** *v. a.* (*deprædari*, Lat.) 1. To rob; to pillage. 2. To spoil; to devour (*Bacon*).

DEPREDA'TION. *s.* (*deprædatio*, Latin.) 1. A robbing; a spoiling (*Hayward*). 2. Voracity; waste (*Bacon*).

DEPREDA'TOR. *s.* (*deprædator*, Latin.) A robber; a devourer (*Bacon*).

To **DEPREHE'ND.** *v. a.* (*deprehendo*, Latin.) 1. To catch one; to take unawares (*Hooker*). 2. To discover; to find out a thing (*Bacon*).

DEPREHE'NSIBLE. *a.* (from *deprehend.*) 1. That may be caught. 2. That may be understood, or discovered.

DEPREHE'NSIBLENESS. *s.* 1. Capableness of being caught. 2. Intelligibleness; easiness to be understood.

DEPREHE'NSION. *s.* (*deprehensio*, Lat.) 1. A catching or taking unawares. 2. A discovery.

To **DEPRE'SS.** *v. a.* (from *depressus*, Lat.) 1. To press or thrust down. 2. To let fall; to let down (*Newton*). 3. To humble; to deject; to sink (*Addison*).

DEPRESSED LEAF. In botany, hollow in the middle; or, having the disk more depressed than the sides. This term has reference to succulent leaves only; and is opposed to convex, in Philos. Bot. and to compressed, in Delin. Pl. Applied also to seeds; as in cynoglossum.

DEPRE'SSION. *s.* (*depressio*, Latin.) 1. The act of pressing down (*Wotton*). 2. The sinking or falling in of a surface (*Boyle*). 3. The act of humbling; abasement (*Bacon*).

DEPRESSION OF EQUATIONS, in algebra, an operation by which an equation is reduced so as to become of lower dimensions.

If any equation contain equal roots, these may be found, and the equation reduced as many dimensions lower, as there are equal roots. For if the original equation $x^{n}-px^{n-1}+qx^{n-2}-\&c.=o$, have m equal roots, the equation $nx^{n-1}-n-1.\,px^{n-2}+\overline{n-2}\,qx^{n-3}-\&c.=o$, has $m-1$ of those roots, as may be readily shewn. Hence, when there are m equal roots, the two equations have a common measure of this form $\overline{x-a}|^{m-1}$ (a being one of the roots) which may be obtained in the usual way, and m roots of the original equation may thus be known. Divide this equation by $\overline{x-a}|^{m}$, and the resulting equation, of $n-m$ dimensions, contains the other roots.

Thus, let the cubic $x^3-px^2+qx-r=o$, have two equal roots; then $3x^2-2px+q=o$ has one of them; and the two equations have a common measure which is a simple equation: the quantities $3x^3-3px^2+3qx-3r$, and $3x^2-2px+q$, have also the same common measure, which being found, we have $\frac{6q-2p^2}{3}x-\frac{qr-pq}{3}$ for a divisor of the equation $x^3-px^2+qx-r=o$; this divisor being likewise put $=o$, we obtain $x=\frac{qr-pq}{6q-2p^2}$. Thus two roots of the equation are discovered; and, since p is the sum of all the roots, the third root is the difference between p and the sum of the two equal roots.

If two roots of an equation be of the form $+a$, $-a$, differing only in their signs; change the signs of the roots, and the resulting equation has two roots $+a$, $-a$; thus we have two equations with a common measure, x^2-a^2, which may be found, and the equation depressed, as in the preceding case. (*See Waring's Med. Alg. cap.* 3.)

DEPRESSION OF THE SUN OR A STAR, in astronomy, is its distance at any time below the horizon, measured by an arc of a vertical circle.

DEPRESSION OF THE POLE, that bringing of the elevated pole nearer the horizon which is occasioned by the motion of the observer toward the equator.

DEPRESSION OF THE VISIBLE HORIZON, denotes its sinking or dipping below the true horizontal plane; whether caused by some variation of the atmosphere, or by the different height of the observer's eye above the surface of the sea.

Thus, in fig. 1. Pl. 57. where the observer is situated above the earth at A; without refraction the visual ray would be AE, and in that case E is the most distant point which could be seen; but by refraction, the ray FG, coming from the point G, may be seen at F, so as to go on from thence in the line FA; and then the view is extended as far as G, and the depression of the horizon of the sea is in the line AF, which points higher than AE, but extends the view farther. From an inspection of the figure it is evident, that, if the refraction were greater, the view would be extended still farther, as to M; though the depression of the horizon of the sea would then be less, as is shewn by the line ALM: whence also it appears, that, by reason of the difference of refraction in the air, our horizon is sometimes more extensive than at others.

The depression, or dip, may be readily calculated: for, in fig. 2. the eye being at B, the sensible horizon is FG, and the depression is the angle FBA: but this angle as well as ACB is the complement of ABC; therefore the angle C is equal to the depression. Hence, we have

CA : CB : : rad.: sec. of C:
or as CB : CA : : rad.: cosin. of C.

By either of which analogies a table may be readily constructed, for any heights BD. The depression by calculation is in all cases greater than that by observation; but the difference is variable, as is the refraction which causes it. Tables of the depression are given in the Requisite Tables for the Nautical Almanac.

DEPRESSOR, (*depressor*, from *deprimo*, to press down). In anatomy. Several muscles are so termed, because they depress the parts into which they are inserted.

Depressor alæ nasi. See Depressor labii superioris alæque nasi.

Depressor anguli oris. Triangularis of Winslow. Depressor labiorum communis of Douglas. A muscle of the mouth and lip, situated below the under lip. It arises, broad and fleshy, from the lower edge of the lower jaw, near the chin; and is inserted into the angle of the mouth, which it pulls downwards.

Depressor labii superioris alæque nasi. Depressor alæ nasi of Albinis. Incisivus medius of Winslow. Depressor labii superioris proprius of Douglas. A muscle of the mouth and lip, situated above the mouth, that draws the upper lip and ala nasi downwards and backwards. It arises, thin and fleshy, from the superior maxillary bone, immediately above the joining of the gums, with the two incisor teeth and cuspidatus; from thence it runs upwards, and is inserted into the upper lip and root of the ala of the nose.

Depressor labii inferioris. Quadratus of Winslow. Depressor labii inferioris proprius of Douglas. A muscle of the mouth and lip, that pulls the under lip and skin of the side of the chin downwards, and a little outwards.

Depressor labii superioris proprius. See Depressor labii superioris alæque nasi.

Depressor labiorum communis. See Depressor anguli oris.

Depressor oculi. See Rectus inferior oculi.

Depre'ssor. *s.* (*depressor*, Lat.) He that keeps or presses down.

DEPRIMENS. See Rectus inferior oculi.

DE'PRIMENT. *a.* (*deprimens*, Lat.) That presses or pulls downward (*Derham*).

DEPRIVA'TION. *s.* (from *de* and *privatio*, Latin.) 1. The act of depriving, or taking away from. 2. The state of losing (*Bentley*).

Deprivation, in the common law, the act of bereaving, divesting, or taking away a spiritual promotion or dignity: as when a bishop, vicar, prebendary, or the like, is deposed or deprived of his preferment, for some matter or fault, in facet, or in law. It is of two kinds; *a beneficio*, and *ab officio*.

Deprivation a beneficio, is when for some great crime a minister is wholly and for ever deprived of his living or preferment: which differs from suspension, in that the latter is only temporary.

Deprivation ab officio, is when a minister is for ever deprived of his order: which is the same, in reality, with what we otherwise call deposition and degradation; being usually for some heinous crime deserving death, and is performed by the bishop in a solemn manner.

To DEPRI'VE. *v. a.* (from *de* and *privo*, Lat.) 1. To bereave one of a thing (*Claren.*). 2. To hinder; to debar from (*Dryden*). 3. To release; to free from (*Spenser*). 4. To put out of any office (*Bacon*).

DEPTFORD, a town of Kent, rendered famous for its fine dock-yard, belonging to the king, where ships for the royal navy are built. In this town are two hospitals, one of which containing 21 houses, was incorporated in the reign of Henry VIII. in the form of a college, and is called the Trinity House of Deptford Strond. The other, which was built by the corporation belonging to the former, consists of 38 houses; both hospitals being for the use of decayed pilots or masters of ships, or their widows; the men are allowed 20*s.* and the women 16*s.* per month. This town is 4 miles E. of London. The number of inhabitants in 1801, was 17,548; but there has been a gradual increase since that time; so that now the inhabitants are supposed to amount to above 20,000.

DEPTH. *s.* (from *deep*, or *diep*, Dutch.) 1. Deepness; the measure of any thing from the surface downward (*Bacon*). 2. Deep place; not a shoal (*Dryden*). 3. The abyss; a gulph of infinite profundity (*Proverbs*). 4. The middle or height of a season: applied commonly to winter (*Clarendon*). 5. Abstruseness; obscurity (*Addison*).

Depth of a squadron or battalion, is the number of men in the file.

To DE'PTHEN. *v. a.* (*diepen*, Dutch.) To deepen or make deeper

To DEPU'CELATE. *v. a.* (*depuceler*, Fr.) To deflour; to bereave of virginity.

DEPU'LSION. *s.* (*depulsio*, Latin.) A beating or thrusting away.

DEPU'LSORY. *a.* (from *depulsus*, Latin.) Putting away; averting.

To DE'PURATE. *v. a.* (*depurer*, French.) To purify; to cleanse (*Boyle*).

De'purate. *a.* (from the verb.) 1. Cleansed; freed from dregs. 2. Pure; not contaminated (*Glanville*).

DEPURA'TION *s.* (*depuratio*, Latin.) 1. The act of separating the pure from the impure part of any thing (*Boyle*). 2. The cleansing of a wound from its matter.

To DEPU'RE. *v. a.* (*depurer*, French.) 1. To free from impurities. 2. To purge (*Ral.*).

DEPUTA'TION. *s.* (*deputation*, French.) 1. The act of deputing, or sending away with a special commission. 2. Vicegerency (*South*).

DEPUTATUS, a name applied by the ancients, to those who made armour.

DEPUTATUS, denotes also a kind of usher or tipstaff to the patriarch of Constantinople.

To DEPU'TE. *v. a.* (*deputer*, French.) To send with a special commission; to impower one to transact instead of another (*Roscom.*).

DE'PUTY. *s.* (*deputé*, Fr. from *deputatus*, Latin.) 1. A lieutenant; a viceroy (*Hale*). 2. One that transacts business for another (*Hooker*).

To DEQUA'NTITATE. *v. a.* (from *de* and *quantitas*, Latin.) To diminish the quantity of.

DER. In the beginning of names of places, is derived from ꝺeoꞃ, a wild beast, unless the place stands upon a river; then from the British *dur*, i. e. water (*Gibson*).

To DERA'CINATE. *v. a.* (*deraciner*, Fr.) To pluck or tear up by the roots (*Shakspeare*).

To DERA'IGN. *To* DERA'IN. *v. a.* (*disrationare*, or *dirationare*, Latin.) To prove; to justify (*Blount*). 2. To disorder; to turn out of course.

DERA'IGNMENT. *s.* (from *deraign.*) 1. The act of deraigning or proving. 2. A disordering, or turning out of course. 3. A discharge of profession; a departure out of religion (*Blount*).

DERA'Y. *s.* (from *desrayer*, Fr.) Tumult; disorder; noise.

DERBENT, a strong town of Shirvan, a province of Persia, in Asia, said to be founded by Alexander the Great. It was always a place of importance, and is a strong pass from Muscovy and Tartary into Persia. The Muscovites took this town in 1723, and it was ceded to them in 1735, by a treaty with Kouli Khan, emperor of Persia. Lat. 42. 8 N. Lon. 50. 0 E.

DERBY, the capital town of the county of the same name, having markets on Wednesdays, Fridays, and Saturdays. It is seated on the river Derwent, over which there is a handsome stone bridge, and a small brook runs through the town, under several bridges. Here are five parish-churches. Upon the Derwent is sir Thomas Lombe's curious engine for the manufacturing of silk, for a perfect model of which the parliament of Great Britain allowed him 14,000l. It is governed by a mayor, and sends two members to parliament. All Saints' church is a beautiful Gothic structure, erected in the reign of queen Mary, at the charges of the maidens and bachelors of the town. It gives the title of earl to the Stanley family. The Scotch rebels came as far as this town in 1745, and then returned back to Scotland. Derby contains 2170 houses, and 10,832 inhabitants. Lat. 52. 58 N. Lon. 1. 25 W.

DERBYSHIRE, an English county, bounded on the N. by Yorkshire; on the E. by Nottinghamshire; on the S. by Leicestershire and a point of Warwickshire; on the W. by Staffordshire; and on the N.W. by Cheshire. It extends 59 miles in length from N. to S. and 34 from E. to W. where broadest; but in the S. part it is not above six. It is divided into six hundreds, in which are 11 market towns, and 106 parishes. It is seated in the diocese of Lichfield and Coventry, and sends four members to parliament; two for the county, and two for the town of Derby. The air, especially on the E. side, is wholesome and agreeable: but in the mountains of the Peak, towards the N. it is sharp and cold. The N. and W. parts are hilly and stony. The hills in the northern part of the county, by attracting the passing clouds, cause the rain to descend there in greater abundance than on the circumjacent counties. Little timber, or even underwood, grows here, and the fields are universally enclosed by stone walls. This county contains about 1,600,000 acres of land, about one-eighth of which are uncultivated. The number of houses, in 1800, was 33,191, and of inhabitants 161,142. It furnishes 939 men to the national militia. The principal rivers are the Derwent, Dove, Erwash, and Trent.

DERBYSHIRE SPAR. See FLUOR SPAR.

To DERE. *v. a.* (ꝺeꞃian, Saxon.) To hurt (*Sp.*).

DEREHAM, a town of Norfolk, having a market on Fridays, where great quantities of woollen yarn are sold. Lat. 52. 42 N. Lon. 1. 0 E.

DERELI'CTION. *s.* (*derelictio*, Latin.) An utter forsaking or leaving (*Hooker*).

DERELI'CTS. *s.* pl. (In law.) Goods wilfully thrown away, or relinquished.

DERHAM (William), an English divine and philosopher. He was born at Stoughton, near Worcester, in 1657, and educated at Trinity college, Oxford. On entering into orders he obtained the vicarage of Wargrave, in Berkshire. In 1689 he was presented to the rectory of Upminster, in Essex. Here he devoted himself to philosophical pursuits, became a member of the Royal Society, and contributed largely to the Philosophical Transactions. In 1713 he published his Physico Theology, being the substance of his Boyle's Lectures, with curious notes; and in 1714 appeared his Astro Theology, which had also been delivered at the same lecture. In 1716 he was made canon of Windsor, and in 1730 the university of Oxford conferred on him the degree of D.D. He assisted various writers, and published some pieces of Mr. Ray. The last thing he published of his own writing was Christo Theology, or a Demonstration of the divine Authority of the Christian Religion, 1730. In his younger days he published a treatise, entitled, The Artificial Clockmaker, in 12mo. which has been several times reprinted. He died at Upminster, in 1735.

Dr. Derham had many papers inserted in different volumes of the Phil. Trans. He also edited some works of Dr. Halley's and Dr. Hooke's. He was very exemplary in the discharge of his duties as a parish priest: and being well skilled in medical science, he exerted himself generously as a physician to the bodies as well as the souls of his parishoners.

To DERI'DE. *v. a.* (*derideo*, Lat.) To laugh at; to mock; to turn to ridicule (*Tillotson*).

DERI'DER. *s.* (from the verb.) A mocker; a scoffer (*Hooker*).

DERI'SION. *s.* (*derisio*, Latin.) 1. The act of deriding or laughing at (*Addison*). 2. Contempt; scorn; a laughing stock (*Milton*).

DERI'SIVE. *a.* (from *deride*.) Mocking; scoffing (*Pope*).

DERI'SORY. *a.* (*derisorius*, Lat.) Mocking; ridiculing.

DERI'VABLE. *a.* (from *derive*.) Attainable by right of descent or derivation (*South*).

DERIVA'TION. *s.* (*derivatio*, Latin.) 1. A draining of water (*Burnet*). 2. (In grammar.) The tracing of a word from its original (*Locke*). 3. The transmission of any thing from its source (*Hale*).

DERIVATION. (*derivatio*, from *derivo*, to drain off). The doctrines of derivation and revulsion, talked of by the ancients, are now wholly exploded, at least in the limited manner in which it was formerly understood. Derivation means the drawing away any disease from its original seat to another part.

DERIVATIONS (Calculus of). See CALCULUS.

DERI'VATIVE. *a.* (*derivativus*, Latin.) Derived or taken from another (*Hale*).

DERI'VATIVE. *s.* (from the adjective.) The thing or word derived from another (*South*).

DERI'VATIVELY. *ad.* (from *derivative*.) In a derivative manner.

To DERI'VE. *v. a.* (from *derivo*, Latin.) 1. To turn the course of water (*South*). 2. To deduce, as from a principal (*Boyle*). 3. To communicate to another, as from the origin and source (*Hooker*). 4. To receive by transmission (*South*). 5. To communicate to by descent of blood (*Felton*). 6. To spread; to diffuse gradually from one place to another (*Davies*). 7. To trace a word from its origin.

To DERI'VE. *v. n.* 1. To come from; to owe its origin to (*Prior*). 2. To descend from (*Shakspeare*).

DERI'VER. *s.* (from *derive*.) One that draws or fetches, as from the original.

DERMA. (Δερμα, the skin.) See CUTIS.

DERMALOGY. (from δερμα, the skin; and λογος, a treatise.) A treatise on the skin or integumentation. Dermatology.

DERMATODES. (Δερματοειδες; from δερμα, a skin or leather, and ειδος, likeness.) See DURAMATER.

DERMATOLOGY. DERMATOLOGIA. (*dermatologia*, δερματολογια; from δερμα, the true skin, and λογος, a discourse.) A treatise upon the skin.

DERMATO-PATHOLOGIA. (*dermato-pathologia*; from δερμα, the skin, and παθολογια, the pathology.) A treatise on diseases of the skin.

DERMESTES. Leather-eater. In zoology, a genus of the class insecta, order coleoptera. Antennas clavate; the club perfoliate; three of the joints thicker; thorax convex slightly margined; head inflected, and hid under the thorax. The larvas or grubs of this tribe devour dead bodies, skins, leather, and almost any animal substance, and are exceedingly destructive to books and furniture. Eighty-five species; chiefly inhabitants of Europe, and nine of our own country. They may be thus distributed:

A. bifid jaw.

B. one-toothed jaw: the apate of Fabricius.

C. feelers four, clavate, the last joint larger. the colydium-tribe of Fabricius. The following are mostly worthy of remark.

1 D. lardarius: black; shells cinereous on the upper half. Inhabits Europe; and as an insect, is the most common pest of museums, libraries and preparations of natural history: it is also found in old bacon: the larva is oval and hairy.

2. D. domesticus. Black; shells grey, edged round with black; thorax gibbous, covered with ferruginous down. Inhabits Europe, and is the little insect that makes the round holes in our furniture, reducing it to powder.

3. D. fumatus. Oblong, testaceous, eyes black. Inhabits Europe, on flowers and in houses, and has a great resemblance.

4. D. violaceus. Blueish-black; thorax downy; legs black; being splendid and elegant. Inhabits Europe, and found in dead bodies.

5. D. Surinamensis. Testaceous; thorax crenate; carinate on the back; shells striate, body brownish. Inhabits South America; in flour and meal that have been kept too long. See Nat. Hist. Pl. LXXII.

DERN. *a.* (ꝺeaꞃn, Saxon.) Obsolete. 1. Sad; solitary. 2. Barbarous; cruel.

DERNIE'R. *a.* (French.) Last (*Ayliffe*).

DERNIER RESORT. See RESORT.

To DE'ROGATE. *v. a.* (*derogo*, Latin.) 1. To do an act contrary to a law or custom, as to diminish its former extent (*Hale*). 2. To lessen the worth of any person or thing; to disparage.

To DE'ROGATE. *v. n.* 1. To detract; to lessen reputation (*Hooker*). 2. To degenerate; to act beneath one's rank.

DE'ROGATE. *a.* (from the verb.) Degraded; lessened in value (*Shakspeare*).

DEROGA'TION. *s.* (*derogatio*, Latin.) 1. The act of weakening or restraining a former law or contract (*South*). 2. The act of lessening or taking away the honour of any person or thing (*Hooker*).

DERO'GATIVE. *a.* (*derogativus*, Latin.) Detracting; lessening the honour of (*Brown*).

DERO'GATORILY. *ad.* (from *derogatory*.) In a detracting manner.

DERO'GATORINESS. *s.* (from *derogatory*.) The act of derogating.

DERO'GATORY. *a.* (*derogatorius*, Lat.) That lessens the honour of (*Bacon*).

DERRIS, in zoology, a genus of the class vermes, order mollusca. Body cylindrical, composed of articulations; mouth terminal; feelers two. One species only; found on the coast of Pembrokeshire: moves by an undulatory motion of the whole body.

DERRY. See LONDONDERRY.

DERVIS, or DERVICH, a name given to a sort of monks among the Turks, who lead a very austere life, and profess extreme poverty, though they are allowed to marry. The word is originally Persian, דרויש, signifying a beggar, or person who has nothing: and because the religious, and particularly the followers of Mevelava, profess not to possess any thing, they call both the religious in general, and the Mevelavites in particular, Dervises or Derviches. The dervises, called also Mevelavites, are a Mahometan order of religious; the chief or founder whereof was one Mevelava. They are now very numerous. Their chief monastery is that near Cogna in Natolia, where the general makes his residence, and where all the assemblies of the order are held; the other houses being all dependent on this, by a privilege granted to this monastery under Ottoman I.

The dervises affect a great deal of modesty, patience, humility, and charity. They always go bare-legged and open-breasted, and frequently burn themselves with hot irons to inure themselves to patience. They always fast on Wednesdays, eating nothing on those days till after sun-set. Tuesdays and Fridays they hold meetings, at which the superior of the house presides. One of them plays all the while on a flute, and the rest dance, turning their bodies round and round with the greatest swiftness imaginable. Long custom to this exercise from their youth has brought them to such a habitude, that it does not discompose them at all. This practice they observe with great strictness, in memory of Mevelava their patriarch's turning miraculously round, as they pretend, for the space of four days, without any food or refreshment; his companion Hamsa playing all the while on a flute: after which he fell into an ecstacy, and therein received wonderful revelations for the establishment of his order. They believe the flute an instrument consecrated by Jacob and the shepherds of the Old Testament, because they sang the praises of God upon it. They profess poverty, chastity, and obedience, and really observe them while they remain dervises; and if they choose to go out and marry, they are always allowed.

The generality of dervises are mountebanks: some apply themselves to legerdemain, postures, &c. to amuse the people; others give in to sorcery and magic: but all of them, contrary to Mahomet's precept, are said to drink wine, brandy, and other strong liquors, to give them the degree of gaiety their order requires. Beside their great saint Mevelava, there are particular saints honoured in some particular monasteries; as Kederele, greatly revered in the monasteries of Egypt, and held by some to be St. George; and by others, with more probability, the prophet Elias. The dervises are great travellers; and, under pretence of preaching, and propagating their faith, are continually passing from one place to another: on which account they have been frequently used as spies.

There are also dervises in Persia, called in that country Abdals, q. d. servants of God. They lead a very penurious, austere life, and preach the Alcoran in the streets, coffee-houses, and wherever they can meet with auditors. The Persian dervises retail little but fables to the people, and are in the utmost contempt among the men of sense and letters. There are in Egypt two or three kinds.

DERWENT, a river which rises in Derbyshire, and falls into the Trent, near Nottingham.

DERWENT, a river which rises in the N. Riding of Yorkshire, and running S. falls into that of the Ouse.

DERWENT, a river of Cumberland, which falls into the Irish sea, a little below Cockermouth.

DERWENT-WATER, a lake of Cumberland, in the vale of Keswick. It is three miles in length, and a mile and an half wide. Five islands rise out of this lake, which add greatly to the beauty of its appearance. On one of them is an elegant modern-built house.

DESAGULIERS (John Theophilus), an ingenious philosopher, born in 1683 at Rochelle, from whence his father, who was a minister, brought him when an infant to London, on the revocation of the edict of Nantes. He was educated at Christ college, Oxford, where he proceeded to the degree of LL.D. In 1714 he was chosen F.R.S. He was the first person who ever read lectures on experimental philosophy in London, and he had the honour to read them before George II. Frederic prince of Wales, and the rest of the royal family. The duke of Chandos gave him the living of Edgware, and afterwards another in Essex. He was several times grand-master of the English free-masons. He died in London, in 1749.

Dr. Desaguliers communicated many curious and valuable papers to the Royal Society, which appear in the Phil. Trans. He translated s'Gravesande's Natural Philosophy, and some other works. He also gave an edition of Gregory's Elements of Catoptrics and Dioptrics: and likewise published a comprehensive and valuable Course of experimental Philosophy, in 2 vols. 4to. Recollecting that this gentleman was much noticed by the learned and the great, and possessed two church livings, we cannot account for the circumstance of his dying in obscurity and indigence: yet such, it would seem, was the case; at least, if we may credit the poet Cawthorne, who speaking of the neglected Desaguliers, asks,

> "How he who taught two gracious kings to view,
> All Boyle ennobled, and all Bacon knew,
> Died in a cell, without a friend to save,
> Without a guinea, and without a grave."

DESART, a large extent of country entirely barren, and producing nothing. The Desart, absolutely so called, is that part of Arabia south of the Holy Land, where the children of Israel wandered forty years.

DESAULT (Peter Joseph), a celebrated French surgeon, was born in Feb. 1744, at Magny Vernois, a village near Lure. He was destined for the church, but his genius led him to the study of the healing art, to which he applied with great avidity. He also paid great attention to mathematics. At the age of 19 he went to Paris, where he gave himself up to such a course as was most likely to produce an excellent surgeon, and his reputation was soon established. In 1779 he invented the bandage now in use for fractures. He succeeded Ferrand as chief surgeon of the Hotel-Dieu in Paris. In 1788 he succeeded in his long projected scheme of establishing a clinical school; and when his lectures commenced, his auditory soon became very numerous. More than 600 from different countries constantly attended, in order to learn a new system, consisting of a simple mode of treatment, disengaged from ancient prejudices, and a complex incoherent practice.

A few of his improvements are here specified. 1. The method of ligature employed by the ancients in the cure of umbilical hernias of children, having been generally omitted in the practice of the moderns, he again introduced and perfected this mode, and demonstrated, by his success, its superiority over compressive bandages. 2. He was one of the first men in France to extract the loose cartilages (cartilages flottans) in joints. 3. He employed a new treatment, that of a methodical compression, in respect to schirrosities of the rectum; in order to which he introduced a candle or bougie, the size of which he gradually augmented. 4 He simplified, and rendered more commodious, the reduction of luxations of the humerus. 5. Fatal experience having pointed out the danger of employing the trepan in wounds of the head, he substituted another method of treatment (l'usage de l'émétique) now adopted by many practitioners. 6. He made several very useful improvements on chirurgical instruments: such as those employed in the cases of polypus in the womb and nostrils (la pince à gaine et des porte-nœuds pour la ligature des polypes, &c.); for cutting through obstructions in the different cavities (le kiotome); and for the fistula in ano. In cases of incision he introduced the use of the instrument (le gorgeret) invented by Marchetti, well known among foreigners, but almost totally neglected in France before this period.

He at the same time retrenched the use of a great number of superfluous ones, and banished all practices attended with greater pain than utility. Avoiding every thing that was complex, he proved that the art of healing, in imitation of nature, ought to be simple in its means, and fruitful in its resources.

In 1791 he published his Journal de Chirurgerie, which was edited by his pupils, and destined to describe the most interesting occurrences in his school, and also extracts from his lectures, which were then dedicated to the investigation of the maladies incident to the urinary passage. This was translated into English by the late Mr. Gosling.

In consequence of an unjust accusation of Chaumette, he was thrown into the horrid prison of the Luxembourg, from which few departed but in the way to the Guillotine; he was, however, liberated at the end of three days.

On the establishment of L'Ecole de Santé, Desault was appointed clinical professor; and for external maladies he soon after obtained from the government the conversion of the Eveché into an hospital for surgical operations. In the midst of these plans, the troubles that occurred in the month of May, 1795, unfortunately affected his mind, and made him dread lest the days of proscription should return. It was in vain that his friends attempted to soothe his sufferings; for on the night of the 29th of May, a malignant fever made its appearance, and a nearly continual delirium ensued until his death, which occurred on the first of June 1795, on which day he breathed his last, in the arms of his pupils, at the age of 51. The French republic, eager to pay homage to his memory, presented his widow with a pension of 2000 livres per annum. A son, Alexis Mathias Desault, was the sole fruit of his marriage; and he has left but one work behind him, in which the name of his friend Chopart is joined with his own. It is entitled Traité des Maladies Chirurgicales et des Operations qui leur conviennent, 2 vols. 8vo.

DE'SCANT. *s.* (*discanto*, Italian.) 1. A song or tune composed in parts (*Milton*). 2. A discourse; a disputation; a disquisition branched out into several heads (*Shakspeare*).

Descant, in music, the art of composing in several parts. It is of three kinds, namely, plain, figurative, and double. *Plain descant* is the groundwork of all compositions, consisting altogether in the orderly placing of many concords answering to simple counter-point. *Figurative descant* is that wherein discords are concerned as well as concords; and this properly may be denominated the ornament or rhetorical part of music. For in this are introduced all the varieties of points, fuges, syncopes or bindings, diversity of measures, intermixtures of discording sounds, or whatever else art and fancy can exhibit, which set forth and adorn the composition; whence it is named florid or figurative descant. *Double descant* is so called when the parts are so contrived that the treble may be made the bass, and the bass the treble.

To De'scant. *v. n.* 1. To sing in parts. 2. To discourse at large; to make speeches: in censure or contempt (*Milton*).

To DESCE'ND. *v. n.* (*descendo*, Latin.) 1. To come from a higher place to a lower; to fall; to sink (*Matthews*). 2. To come suddenly; to fall upon as from an eminence (*Pope*). 3. To make an invasion (*Dryden*). 4. To proceed as from an original (*Collier*). 5. To fall in order of inheritance to a successour (*Locke*). 6. To extend a discourse from general to particular consideration (*D. of Piety*).

To Desce'nd. *v. a.* To walk downward upon any place (*Milton*).

DESCE'NDANT. *s.* (*descendant*, French.) The offspring of an ancestor (*Bacon*).

DESCE'NDENS. *a.* (*descendens*, Latin.) 1. Falling; sinking; coming down (*Ray*). 2. Proceeding from another, as an original or ancestor (*Pope*).

DESCE'NDIBLE. *a.* (from *descend.*) 1. Such as may be descended. 2. Transmissible by inheritance (*Hale*).

DESCENDING, in music, making a transition from one note to another which is less acute.

Descending latitude, is the latitude of a planet in its return from the nodes to the equator.

DESCE'NSION. *s.* (*descensio*, Latin.) 1. The act of falling or sinking; descent. 2. A declension; a degradation (*Shakspeare*). 3. (In astronomy.) *Right* DESCENSION is the arch of the equator, which descends with the sign or star below the horizon of a direct sphere. *Oblique* DESCENSION is the arch of the equator, which descends with the sign below the horizon of an oblique sphere.

DESCE'NSIONAL. *a.* (from *descension.*) Relating to descent.

Descensional difference, is the difference between the right and oblique descensions of the same star, or point of the heavens.

DESCENSUS. (*descensus*, from *descendo*, to move downwards). Chemists call it a distillation per descentum, by descent, when the fire is applied at top, and round the vessel, whose orifice is at the bottom.

DESCE'NT. *s.* (*descensus*, Latin.) 1. The act of passing from a higher to a lower place (*Blackmore*). 2. Progress downwards (*Locke*). 3. Obliquity; inclination (*Woodward*). 4. Lowest place (*Shakspeare*). 5. Invasion; hostile entrance (*Clarendon*) 6. Transmission of any thing by succession and inheritance (*Locke*). 7. The state of proceeding from an original or progenitor (*Atterbury*). 8. Birth; extraction; process of lineage (*Shakspeare*). 9. Offspring; inheritors (*Milton*). 10. A single step in the scale of genealogy; a generation (*Hooker*). 11. A rank in the scale of subordination (*Milton*).

Descent, in general, is the tendency, or passage, of a body from a higher to a lower place; thus all bodies, unless otherwise determined by a force superior to their gravity, descend towards the centre of the earth: the planets too may be said to descend from their aphelion to the perihelion of their orbits, as the moon does from the apogee to the perigee. Heavy bodies, meeting with no resistance, descend with an uniformly accelerated motion; for the laws relative to which see ACCELERATION. See also DEVIATION, and INCLINED PLANE.

Descent (Line of swiftest). See CURVE OF QUICKEST DESCENT.

Descent, or Hereditary succession, is the title of which a man on the death of his ancestor acquires his estate by right of representation, as his heir at law: and an estate so descending to the heir is in law called the inheritance.

Descent is of three kinds; by common law, by custom, or by statute. By common law, as where one hath land of inheritance in fee-simple, and dieth without disposing thereof in his life-time, and the land goes to the eldest son and heir of course, being cast upon him by the law.

Descent of fee-simple, by custom, is sometimes to all the sons, or to all the brothers (where one brother dieth without issue), as in gavel-kind; sometimes to the youngest son, as in borough English; and sometimes to the eldest daughter, or the youngest, according to the customs of particular places. Descent by statute is of fee-tail, as directed by the statute of Westminster, 2 de donis.

Descent, in genealogy, the order or succession of descendants in a line or family; or their distance from a common progenitor. Thus we say, one descent, two descents, &c.

Descent, in heraldry, is used to express the coming down of any thing from above; as, a lion en descent, is a lion with his head towards the base points, and his heels towards one of the corners of the chief, as if he were leaping down from some high place.

Descent, in fortification, are the holes, vaults, and hollow places made by undermining the ground.

The descent into the moat or ditch is a deep passage made through the esplanade and covert-way, in form of a trench, whereof the upper part is covered with madriers and clays, to secure the besiegers from the enemy's fire. In wet ditches this trench is on a level with the surface of the water, but in dry ones it is sunk as deep as the bottom of the ditch.

To DESCRI'BE. *v. a.* (*describo*, Latin.) 1. To delineate; to mark out: as, a torch waved about the head *describes a* circle. 2. To mark out any thing by the mention of its properties (*Watts*). 3. To distribute into proper heads or divisions (*Joshua*). 4. To define in a lax manner.

DESCRI'BER. *s.* (from *describe.*) He that describes (*Brown*).

DESCRI'ER. *s.* (from the verb.) A discoverer; a detecter (*Crashaw*).

DESCRI'PTION. *s.* (*descriptio*, Latin.) 1. The act of delineating any person or thing by perceptible properties. 2. The sentence or passage in which any thing is described (*Dryden*). 3. A lax definition (*Watts*). 4. The qualities expressed in a description (*Shakspeare*).

To DESCRY'. *v. a.* (*descrier*, French.) 1 To give notice of any thing suddenly discovered. obsolete. 2. To spy out; to examine at a distance (*Shakspeare*). 3. To detect; to find out any thing concealed (*Wotton*). 4. To discover; to perceive by the eye; to see any thing distant or obscure (*Prior*).

Descry'. *s.* (from the verb.) Discovery; thing discovered (*Shakspeare*).

DESEADA, or **Desiderada**, the first of the Caribbee Islands, discovered by Columbus, in his second voyage, 1494. Lat. 16. 40 N. Lon. 16. [illegible] W.

Deseada, or Cape Desire, the southern point of the Streights of Magellan, in S. America, at the entrance of the Pacific ocean. Lat. [illegible] Lon. 74. 18 W.

To DESECRATE. *v. a.* (*desecro*, Latin)

To divert from the purpose to which any thing is consecrated ([illegible]).

DESECRA'TION. *s.* (from *desecrate.*) The abolition of consecration.

DE'SERT. *s.* See Désart.

De'sert. *a.* (*desertus*, Lat.) Wild; waste; solitary; uninhabited (*Locke*).

To Dese'rt. *v. a.* (*deserter*, French.) 1. To forsake; to fall away from; to quit meanly or treacherously (*Dryden*). 2. To leave; to abandon (*Bentley*).

Dese'rt. *s.* (from *deserve.*) 1. Qualities or conduct considered with respect to rewards or punishments; degree of merit or demerit (*Hooker*). 2. Proportional merit; claim to reward (*South*). 3. Excellence; right to reward; virtue (*Shakspeare*).

DESE'RTER. *s.* (from *desert.*) 1. He that has forsaken his cause or his post (*Dryden*). 2. He that leaves the army in which he was enlisted (*Decay of Piety*). 3. He that forsakes another (*Pope*).

Deserter, in a military sense, a soldier who by running away from his regiment or company abandons the service.

A deserter is, by the articles of war, punishable by death, and, after conviction, is hanged at the head of the regiment he formerly belonged to, with his crime written on his breast, and suffered to hang till the army leave that camp, for a terror to others. But the court-martial has a proper discretionary power for the exercise of lenity, whenever such lenity may seem likely to be beneficial to the general discipline.

DESE'RTION. *s.* (from *desert.*) 1. The act of forsaking or abandoning a cause or post (*Rogers*). 2. (In theology.) Spiritual despondency; an opinion that grace is withdrawn (*South*).

DESE'RTLESS. *a.* (from *desert.*) Without merit; without claim to favour (*Dryden*).

To DESE'RVE. *v. a.* (*deservir*, French.) 1. To be worthy of either good or ill (*Hooker*). 2. To be worthy of reward (*South*).

DESE'RVEDLY. *ad.* (from *deserve.*) Worthily, according to desert (*Milton*).

DESE'RVER. *s.* (from *deserve.*) A man who merits rewards (*Wotton*).

DESHACHE, in heraldry, is where a beast has its limbs separated from its body, so that they still remain on the escutcheon, with only a small separation from their natural places.

DESHAIS (John Baptist Henry), a celebrated French painter, born at Rouen in Normandy, in 1729. As early as 1751 he won the first prize of the academy, and became a pupil in the king's school, under Carlo Vanloo. After studying there and at Rome he was elected into the academy. He died in 1765. His principal pictures are those of the marriage of the Virgin, the resurrection of Lazarus, and Joseph and his mistress.

DESI'CCANTS. *s.* (from *desiccate.*) Applications that dry up the flow of sores (*Wiseman*).

To DE'SICCATE. *v. a.* (*desicco*, Lat.) 1. To dry up; to exhaust of moisture (*Hale*). 2. To exhale moisture (*Bacon*).

DESICCATION, in chemistry, evaporation to driness, or any other mode by which driness in a substance containing moisture is produced.

DESI'CCATIVE. *a.* (from *desiccate.*) That has the power of drying.

To DESI'DERATE. *v. a.* (*desidero*, Lat.) To want; to miss; to desire in absence (*Cheyne*).

DESIDERATUM, (from *desidero*, I desire,) is used to signify a desirable perfection in any art or science: thus, it is a desideratum with the blacksmith to render iron fusible by a gentle heat, and yet preserve it hard enough for ordinary uses; with the glass-man and looking-glass maker, to render glass malleable; with the clock-maker, to bring pendulums to be useful, where there are irregular motions; with the brazier and copper-smith, to make malleable solder; with the ship-wright, to build vessels that will sail under water; with the diver, to procure manageable instruments for conveying fresh air to the bottom of the sea, sufficient for respiration and the burning of lights; with the assay-master, to melt or copel ores of metals immediately without the use of bellows or furnaces; and with the carvers and joiners, to fashion wood in moulds like plaster of Paris, or burnt alabaster.

To DESI'GN. *v. a.* (*designo*, Lat.; *dessiner*, French.) 1. To purpose; to intend any thing. 2. To form or order with a particular purpose (*Stillingfleet*). 3. To devote intentionally (*Clarendon*). 4. To plan; to project; to form in idea (*Dryden*). 5. To mark out (*Locke*).

Desi'gn. *s.* (from the verb.) 1. An intention; a purpose. 2. A scheme; a plan of action (*Tillotson*). 3. A scheme formed to the detriment of another (*Locke*). 4. The idea which an artist endeavours to execute or express (*Addison*).

In building, we use the term *ichnography*, when by *design* is only meant the plan of a building, or a flat figure drawn on paper. *Orthography*, when some face, or side, of the building is raised from the ground. And *scenography*, when both front and sides are seen in perspective.

Design, in manufactories, expresses the figures with which the workman enriches his stuff, or silk, and which he copies after some painter, or eminent draughtsman, as in diaper, damask, flowered silk, tapestry, and the like.

In undertakings of such kinds of figured stuffs, it is necessary, says M. Savary, that before the first stroke of the shuttle, the whole design be represented on the threads of the warp; we do not mean in colours, but with an infinite number of little packthreads, which, being disposed so as to raise the threads of the warp, let the workmen see, from time to time, what kind of silk is to be put in the eye of the shuttle, for woof. This method of preparing the work is called reading the design and reading the figure, which is performed in the following manner: A paper is provided, considerably broader than the stuff, and of a length proportionate to what is intended to be represented on it. This they divide lengthwise, by as many black lines as there are intended threads in the warp; and cross these lines, by others drawn breadthwise, which, with the former, make little equal squares; on the paper thus squared, the draughtsman designs his figures, and heightens them with colours as he sees fit. When the design is finished, a workman reads it, while another lays it on the simblot.

To read the design, is to tell the person who manages the loom the number of squares, or threads, comprised in the space, intimating at the same time whether it is ground or figure. To put what is read on the simblot, is to fasten little strings to the several packthreads, which are to raise the threads named; and thus they continue to do till the whole design is read. Every piece being composed of several repetitions of the same design, when the whole design is drawn, the drawer, to begin the design afresh, has nothing to do but raise the little strings, with slip-knots, to the top of the simblot, which he had let down to the bottom: this he is to repeat as often as is necessary till the whole is manufactured. The ribbon-weavers have likewise a design, but far more simple than that now described. It is drawn on paper, with lines and squares representing the threads of the warp and woof. But instead of lines of which the figures of the former consist, these are constituted of points only, or dots, placed in certain of the little squares, formed by the intersection of the lines. These points mark the threads of the warp that are to be raised, and the spaces left blank denote the threads that are to keep their situation: the rest is managed as in the former.

Design is also used, in painting, for the first idea of a large work, drawn roughly, and in little, with an intention to be executed and finished in large.

DESI'GNABLE. *a* (*designo*, Lat.) Distinguishable; capable to be particularly marked out (*Digby*).

DESIGNA'TION. *s.* (*designatio*, Latin.) 1. The act of pointing or marking out by some particular token (*Swift*). 2 Appointment; direction (*Bacon*). 3. Import; intention (*Locke*).

DESIGNATOR, a Roman officer, who assigned each person his place and rank in public ceremonies, processions, &c.

DESI'GNEDLY. *ad.* (from *design.*) Purposely; intentionally; not inadvertently (*Ray*).

DESI'GNER. *s.* (from *design.*) 1. One that designs or intends; a purposer. 2. A plotter; a contriver (*Decay of Piety*). 3. One that forms the idea of any thing in painting or sculpture (*Addison*).

DESI'GNING. *part. a.* (from *design.*) Insidious; treacherous; deceitful (*Southern*).

DESI'GNLESS. *a.* (from *design.*) Without design; unknowing; inadvertent.

DESI'GNLESSLY. *ad.* Without intention; ignorantly; inadvertently (*Boyle*).

DESI'GNMENT. *s.* (from *design.*) 1. A purpose and intent (*Glanville*). 2. A scheme of hostility (*Shakspeare*). 3. The idea, or sketch, of a work (*Dryden*).

DESI'RABLE. *a.* (from *desire.*) 1. That is to be wished with earnestness (*Rogers*). 2. Pleasing; delightful (*Addison*).

DESIRE, according to the common acceptation of the term, may be considered as an eager longing for some apparent good, centered in particular objects, situations, or circumstances. This general description comprehends two different acts of the mind concerning such objects, which lord Kaimes expresses thus: "Desire, taken in its proper sense, is that internal act which by influencing the will, makes us proceed to action. Desire in a lax sense, respects also actions and events that depend not on us; as when I desire that my friend may have a son to represent him; or that my country may flourish in arts and sciences: but such internal act is more properly termed a wish than desire." Though this observation does not fully mark the difference, it plainly indicates that there is one. In the first sense, desire may be defined as by Dr. Cogan, that uneasy sensation excited in the mind by the view or contemplation of any desirable good, which is not in our possession, which we are solicitous to obtain, and of which the attainment appears at least possible. See Wish.

To Desi're. *v. a.* (*desirer*, French.) 1. To wish; to long for (*Deuteronomy*). 2. To express wishes, to appear to long (*Dryden*). 3. To ask; to intreat (*Shakspeare*).

DESI'RER. *s.* (from *desire.*) One that is eager of any thing; a wisher (*Shakspeare*).

DESI'ROUS. *a.* (from *desire.*) Full of desire; eager; longing after; wishing for (*Hooker*).

DESI'ROUSLY. *ad.* Eagerly; with desire.

DESI'ROUSNESS. *s.* Fulness of desire.

To DESI'ST. *v. n.* (*desisto*, Lat.) To cease from any thing; to stop (*Milton*).

DESI'STANCE. *s.* (from *desist.*) The act of desisting; cessation (*Boyle*).

DESI'TIVE. *a.* (*desitus*, Lat.) Ending; concluding; final (*Watts*).

DESK. *s.* (*disch*, a table, Dutch.) An inclining table for the use of writers or readers (*Walton*).

DESMOND, in geography, the name of an ancient district of Ireland, which contained part of the present counties of Kerry and Cork.

DE'SOLATE. *a.* (*desolatus*, Lat.) 1. Without inhabitants; uninhabited (*Broome*). 2. Deprived of inhabitants; laid waste (*Jer.*) 3. Solitary; without society.

To De'solate. *v. a.* (*desolo*, Latin.) To deprive of inhabitants; to lay waste (*Thomson*).

DE'SOLATELY. *ad.* In a desolate manner.

DESOLA'TION. *s.* (from *desolate.*) 1. Destruction of inhabitants; reduction to solitude (*Spenser*). 2. Gloominess; sadness; melancholy (*Sidney*). 3. A place wasted and forsaken (*Jeremiah*).

DESPA'IR. *s.* (*desespoir*, French.) 1. Hopelessness; despondence (*Dryden*). 2. That which causes despair; that of which there is no hope (*Shakspeare*). 3. (In theology.) Loss of confidence in the mercy of God (*Spratt*).

Dr. Cogan calls despair a permanent fear of losing some valuable good, of suffering some dreadful evil, or of remaining in a state of actual misery, without any mixture of hope. It generally succeeds to ineffectual efforts, which have been repeatedly made; and of consequence is excited where no means can be devised equal to the magnitude of the supposed evil.

To Despa'ir. *v. n.* (*despero*, Lat.) To be without hope; to despond (*Wake*).

DESPA'IRER. *s.* (from *despair.*) One without hope (*Dryden*).

DESPA'IRFUL. *a.* (*despair* and *full*) Hopeless: obsolete (*Sidney*).

DESPA'IRINGLY. *ad.* (from *despairing.*) In a manner betokening hopelessness (*Boyle*)

To DESPA'TCH. *v. a* (*depescher*, French.) 1. To send away hastily (*Temple*) 2. To send out of the world; to put to death (*Shakspeare*). 3. To perform a business quickly (*Locke*). 4. To conclude an affair with another (*Shakspeare*).

Despa'tch. *s.* (from the verb.) 1. Hasty execution (*Granville*). 2. Conduct; management: obsolete (*Shakspeare*). 3. Express; hasty messenger or message.

DESPA'TCHFUL. *a.* (from *despatch.*) Bent on haste (*Pope*).

DE'SPERATE. *a.* (*desperatus*, Latin.) 1. Without hope (*Shakspeare*). 2. Without care of safety; rash (*Hammond*). 3. Irretrievable; unsurmountable; irrecoverable (*Locke*). 4. Mad; hotbrained; furious (*Spenser*).

DE'SPERATELY. *ad.* 1. Furiously; madly (*Brown*). 2. In a great degree; violently (*Addison*).

DE'SPERATENESS. *s.* (from *desperate.*) Madness; fury; precipitance (*Hammond*).

DESPERA'TION. *s.* (from *desperate.*) Hopelessness; despair; despondency (*Hammond*).

DE'SPICABLE. *a.* (*despicabilis*, Lat.) Contemptible; vile; mean; sordid (*Hooker*).

DE'SPICABLENESS. *s.* Meanness; vileness; worthlessness (*Decay of Piety*).

DE'SPICABLY. *ad.* (from *despicable.*) Meanly; sordidly; vilely (*Addison*).

DESPI'SABLE. *a.* (from *despise.*) Contemptible; despicable; regarded with contempt (*Arbuthnot*).

To DESPI'SE. *v. a.* (*despiser*, old French.) 1. To scorn; to condemn; to slight (*Pope*). 2. To abhor (*Shakspeare*).

DESPI'SER. *s.* (from *despise.*) Contemner; scorner (*Government of the Tongue*).

DESPI'TE. *s.* (*spijt*, Dutch; *depit*, Fr.) 1. Malice; anger; malignity (*Spratt.*) 2. Defiance; unsubdued opposition (*Rowe*). 3. Act of malice, or opposition (*Milton*).

To Despi'te. *v. a.* (from the noun.) To vex; to offend; to disappoint (*Raleigh*).

DESPI'TEFUL. *a.* (*despite* and *full.*) Malicious; full of spleen (*King Charles*).

DESPI'TEFULLY. *ad.* (from *despiteful*). Maliciously; malignantly (*Matthew*).

DESPI'TEFULNESS. *s.* (from *despiteful.*) Malice; hate; malignity (*Wisdom*).

DESPI'TEOUS. *a.* (from *despite.*) Malicious; furious: out of use (*Spenser*).

To DESPO'IL. *v. a.* (*despolio*, Latin.) 1. To rob; to deprive (*Spenser*). 2. To divest by any accident (*Woodward*). 3. To strip: not in use (*Spenser*).

DESPOLIA'TION. *s.* (from *despolio*, Lat.) The act of despoiling or stripping.

To DESPO'ND. *v. n.* (*despondeo*, Lat.) 1. To despair; to lose hope (*Dryden*). 2. (In theology.) To lose hope of the divine mercy (*Watts*).

DESPO'NDENCY. *s.* (from *despondent.*) Despair; hopelessness; desperation.

DESPO'NDENT. *a.* (*despondens*, Latin.) Despairing; hopeless (*Bentley*).

To DESPO'NSATE. *v. a.* (*desponso*, Lat.) To betroth; to affiance.

DESPONSA'TION. *s.* (from *desponsate.*) The betrothing persons to each other.

DE'SPOT. *s.* (δεσποτης.) An absolute prince; one that governs with unlimited authority.

The word, in its first origin, signified the same with the Latin *herus*, and the English *master* · but in time it underwent the same fate on medals, as, among the Latins, Cæsar did with regard to Augustus: ΒΑϹΙΛΕΥϹ answering to Augustus, and ΔΕϹΠΟΤΗϹ, *despotes*, to Cæsar. Thus, Nicephorus having ordered his son Stauracius to be crowned, the son, out of respect, would only take the name ΔΕϹΠΟΤΗϹ, leaving to his father that of ΒΑϹΙΛΕΥϹ. For it is to be noted, that it was just about the time that the emperors began to cease to use Latin inscriptions. This delicacy, however, did not last long; for the following emperors preferred the quality of ΔΕϹΠΟΤΗϹ to that of ΒΑϹΙΛΕΥϹ, particularly Constantine, Michael Ducas, Nicephorus Botoniates, Romanus Diogenes, the Comnenii, and some others. In imitation of the princes, the princesses likewise assumed the title of ΔΕϹΠΟΙΝΑ. It was the emperor Alexius, surnamed the angel, that created the dignity of despot, and made it the first after that of emperor, above that of Augustus or Sebastocrator and Cæsar.

DESPO'TICAL. Despo'tick. *a.* (from *despot.*) Absolute in power; unlimited in authority; arbitrary (*South*).

DESPO'TICALNESS. *s.* (from *despotical.*) Absolute authority.

DE'SPOTISM. *s.* (*despotisme*, French; from *despot.*) Absolute power.

To DESPU'MATE. *v. n.* (*despumo*, Latin.) To throw off parts in foam; to froth.

DESPUMA'TION. (*despumatio*, from *despumo*, to clarify.) The clarifying of any liquor, by throwing up its foulness in a froth, and removing it.

DESQUAMA'TION. (*desquamatio*, from *desquamo*, to scale off.) The falling off of the cuticle or skin, in the form of small scales.

DESSAU, or Dessaw, a town of Upper Saxony, in Germany, and province of Anhalt; it is subject to its own prince. Lat. 51. 53 N. Lon. 12. 22 E.

DESSE'RT. *s.* (*desserte*, French.) The last course at an entertainment (*King*).

To DE'STINATE. *v. a.* (*destino*, Lat.) To design for any particular end (*Ray*).

DESTINA'TION. *s.* (from *destinate.*) The purpose for which any thing is appointed; the ultimate design (*Hale*).

To DE'STINE. *v. a.* (*destino*, Latin.) 1. To doom; to appoint unalterably to any state or condition (*Milton*). 2. To appoint to any use or purpose (*Arbuthnot*). 3. To devote; to doom to punishment or misery (*Prior*). 4. To fix unalterably (*Prior*).

DESTINIES. In mythology. See PARCÆ.

DE'STINY. *s.* (*destinée*, French.) 1. The power that spins the life, and determines the fate, of living beings (*Shakspeare*). 2. Fate; invincible necessity (*Denham*). 3. Doom; condition in future time (*Shakspeare*).

DE'STITUTE. *a.* (*destitutus*, Latin.) 1. Forsaken; abandoned (*Hooker*). 2. Abject; friendless (*Psalms*). 3. In want of (*Dryden*).

DESTITU'TION. *s.* (from *destitute.*) Want; the state in which something is wanted (*Hooker*).

To DESTRO'Y. *v. a.* (*destruo*, Latin.) 1. To overturn a city; to raze a building to ruin (*Genesis*). 2. To lay waste; to make desolate (*Knolles*). 3. To kill (*Hale*). 4. To put an end to; to bring to nought (*Bentley*).

DESTRO'YER. *s.* (from *destroy.*) The person that destroys; a murderer (*Raleigh*).

DESTRU'CTIBLE. *a.* (from *destruo*, Lat.) Liable to destruction.

DESTRUCTIBI'LITY. *s.* (from *destructible.*) Liableness to destruction.

DESTRU'CTION. *s.* (*destructio*, Lat.) 1. The act of destroying; subversion. 2. Murder; massacre (*Waller*). 3. The state of being destroyed; ruin (*Shakspeare*). 4. A destroyer; a depopulator (*Psalms*). 5. (In theology.) Eternal death (*Matthew*).

DESTRU'CTIVE. *a.* (*destructivus*, low Lat.) That has the quality of destroying; wasteful; causing ruin and devastation (*Dryden*).

DESTRU'CTIVELY. *ad.* Ruinously; mischievously; with power to destroy (*Decay of Piety*).

DESTRU'CTIVENESS. *s.* (from *destructive.*) The quality of destroying or ruining (*Decay of Piety*).

DESTRU'CTOR. *s.* (from *destroy.*) Destroyer; consumer (*Boyle*).

DESUDA'TION. *s.* (*desudatio*, Latin.) A profuse and inordinate sweating.

DE'SUETUDE. *s.* (*desuetudo*, Lat.) Cessation from being accustomed; discontinuance of practice or habit (*Hale*).

DESULTOR, in antiquity, a vaulter or leaper, who, leading one horse by the bridle, and riding another, jumped from the back of one to the other, as the custom was after they had run several courses or heats. Eustathius, on Homer's Iliad, lib. iv. assures us, that instead of two, they had sometimes four or six horses all abreast, and would jump from the first to the fourth or sixth, which was the master piece of their art.

DESULTO'RIOUS, DE'SULTORY. *a.* (*desultorius*, Latin.) Removing from thing to thing; unsettled; immethodical (*Norris*).

To DESU'ME. *v. a.* (*desumo*, Lat.) To take from any thing; to borrow (*Hale*).

To DETA'CH. *v. a.* (*detacher*, French.) 1. To separate; to disengage (*Woodward*). 2. To send out part of a great body of men on an expedition (*Addison*).

DETACHMENT, in military affairs, a certain number of soldiers drawn out from several regiments or companies equally, to be employed as the general thinks proper, whether on an attack, at a siege, or in parties to scour the country.

A detachment of two or three thousand men is a command for a brigadier; eight hundred for a colonel; four or five hundred for a lieutenant-colonel. A captain never marches on a detachment with less than fifty men, a lieutenant, an ensign, and two serjeants. A lieutenant is allowed thirty and a serjeant; and a serjeant ten or twelve men. Detachments are sometimes made of intire squadrons and battalions.

DETACHMENT, in naval affairs, is a certain number of ships of a fleet or squadron, chosen by an admiral or commodore from the others to execute some particular service.

DETA'CHMENT. *s.* (from *detach.*) A body of troops sent out from the main army (*Blackmore*).

To DETA'IL. *v. a.* (*detailler*, French.) To relate particularly; to particularize (*Cheyne*).

DETA'IL. *s.* (*detail*, French.) A minute and particular account (*Woodward*).

To DETA'IN. *v. a.* (*detineo*, Latin.) 1. To keep what belongs to another (*Taylor*). 2. To withhold; to keep back (*Broome*). 3. To restrain from departure (*Judges*) 4. To hold in custody.

DETA'INDER. *s.* (from *detain.*) The name of a writ for holding one in custody.

DETA'INER. *s.* (from *detain.*) He that holds back any one's right; he that detains.

To DETE'CT. *v. a.* (*detectus*, Latin.) To discover; to find out any crime or artifice (*Shakspeare*).

DETE'CTER. *s.* (from *detect.*) A discoverer; one that finds out what another desires to hide (*Decay of Piety*).

DETE'CTION. *s.* (from *detect.*) 1. Discovery of guilt or fraud (*Spratt*). 2. Discovery of any thing hidden (*Woodward*).

DETENTS, in clock-work, are those stops, which, by being lifted up or let down, lock or unlock the clock in striking.

DETENT WHEEL, or HOOP WHEEL, in a clock, that wheel which has a hoop almost round it, wherein there is a vacancy at which the clock locks.

DETE'NTION. *s.* (from *detain.*) 1. The act of keeping what belongs to another (*Shakspeare*). 2. Confinement; restraint (*Bacon*).

To DETER. *v. a.* (*deterreo*, Lat.) To discourage by terrour; to fright from any thing (*Tillotson*).

To DETE'RGE. *v. a.* (*detergo*, Latin.) To cleanse a sore (*Wiseman*).

DETE'RGENT. *a.* (from *deterge.*) That has the power of cleansing (*Arbuthnot*).

DETE'RGENTS. (*detergentia, medicamenta*, from *detergo*, to wipe off.) Those applications are so termed by surgeons, which possess the property of cleansing foul ulcers.

DETERIORA'TION. *s.* (from *deterior*, Lat.) The act of making any thing worse.

DETE'RMENT. *s.* (from *deter.*) Cause of discouragement (*Boyle*).

DETE'RMINABLE. *a.* (from *determine.*) That may be certainly decided (*Boyle*).

To DETE'RMINATE. *v. a.* (*determiner*, French.) To limit; to fix: not in use (*Shakspeare*).

Dete'rminate. *a.* (*determinatus*, Latin.) 1. Definite; determined (*Bentley*). 2. Established; settled by rule (*Hooker*). 3. Decisive; conclusive (*Shakspeare*). 4. Fixed; resolute (*Sidney*). 5. Resolved (*Shakspeare*).

Determinate number. See Number.

Determinate problem, is that which has but one solution, or a certain limited number of solutions; in contradistinction to an indeterminate problem, which admits of infinite solutions.

Such, for instance, is the problem, to form an isosceles triangle on a given line, so that each of the angles at the base shall be double of that at the vertex; which has only one solution: or this, to find an isosceles triangle whose area and perimeter are given; which admits of two solutions.

Determinate section, the name of a Tract, or General Problem, written by the ancient geometrician Apollonius. None of this work has come down to us, excepting some extracts and an account of it by Pappus, in the preface to the seventh book of his Mathematical Collections. He there says that the general problem was, "To cut an infinite right line in one point, so that of the segments contained between the point of section sought, and given points in the said line, either the square on one of them, or the rectangle contained by two of them, may have a given ratio, either to the rectangle contained by one of them and a given line, or to the rectangle contained by two of them."

Pappus farther informs us, that this Tract of Apollonius was divided into two books; that the first book contained six problems, and the second three; that the six problems of the first book contained sixteen epitagmas, or cases, respecting the dispositions of the points; and the second book nine. Farther, that of the epitagmas of the six problems of the first book, four were maxima, and one a minimum: that the maxima are at the second epitagma of the second problem, at the third of the fourth, the third of the fifth, and the third of the sixth; but that the minimum was at the third epitagma of the third problem. Also, that the second book contained three determinations; of which the third epitagma of the first problem, and the third of the second were minima, and the third of the third a maximum. Moreover, that the first book had twenty-seven lemmas, and the second book twenty-four; and, lastly, that both books contained eighty-three theorems.

From such account of the contents of this Tract, and the lemmas also given by Pappus, several persons have attempted to restore, or recompose what they thought might be nearly the form of Apollonius's tract, or the subject of each problem, case, determination, &c.; among whom are Snellius, an eminent Dutch mathematician of the last century; a translation of whose work was published in English by Mr. John Lawson, in 1772, together with a new restoration of the whole work by his friend Mr. William Wales.

DETE'RMINATELY. *ad.* 1. Resolutely; with fixed resolve (*Sidney*). 2. Certainly; unchangeably (*Tillotson*).

DETERMINA'TION. *s.* (from *determinate.*) 1. Absolute direction to a certain end (*Locke*). 2. The result of deliberation (*Calamy*). 3. Judicial decision (*Swift*).

DETE'RMINATIVE. *a.* (from *determinate.*) 1. That uncontrollably directs to a certain end (*Bramhall*). 2. That makes a limitation (*Watts*).

DETE'RMINATOR. *s.* (from *determine.*) One who determines (*Brown*).

To DETE'RMINE. *v. a.* (*determiner*, Fr.) 1. To fix; to settle (*Shakspeare*). 2. To conclude; to fix ultimately (*South*). 3. To bound; to confine (*Atterbury*). 4. To adjust; to limit; to define (*Locke*). 5. To influence the choice (*Locke*). 6. To resolve (*Samuel*). 7. To decide (*Locke*). 8. To put an end to; to destroy (*Shakspeare*).

To Dete'rmine. *v. n.* 1. To conclude; to form a final conclusion. 2. To settle opinion (*Locke*). 3. To end; to come to an end (*Hayward*). 4. To make a decision (*Shakspeare*). 5. To end consequentially (*Temple*). 6. To resolve concerning any thing (*Shakspeare*).

DETERRA'TION. *s.* (*de* and *terra*, Lat.) Discovery of any thing by removal of the earth; the act of unburying (*Woodward*).

DETE'RSION. *s.* (from *detergo*, Lat.) The act of cleansing a sore (*Wiseman*).

DETE'RSIVE. *a.* (from *deterge.*) Having the power to cleanse.

Dete'rsive. *s.* An application that has the power of cleansing wounds (*Wiseman*). See Detergent.

DETERSOR. (from *detergo*, I clear away.) In antiquity, a servant who cleared the tables after meals.

To DETE'ST. *v. a.* (*detestor*, Latin.) To hate; to abhor; to abominate (*South*).

DETE'STABLE. *a.* (from *detest.*) Hateful; abominable; odious (*Hayward*).

DETE'STABLY. *ad.* Hatefully; abominably; odiously (*South*).

DETESTA'TION. *s.* (from *detest.*) Hatred; abhorrence; abomination (*Sidney*).

DETE'STER. *s.* (from *detest.*) One that hates.

To **DETHRO'NE.** *v. a.* (*detroner*, French.) To divest of regality; to throw down from the throne; to deprive of regal dignity.

DETINUE, in law, is a writ which lies where any man comes to goods or chattels either by delivery or by finding, and refuseth to redeliver them; and it lies only for the detaining, when the detaining was lawful. In this writ the plaintiff shall recover the thing detained; and therefore it must be so certain, as that it may be specifically known. Therefore it cannot be brought for money, corn, or the like, for that cannot be known from other money or corn, unless it be in a bag or sack, for then it may be distinguishably marked.

In order, therefore, to ground an action of detinue, which is only for the detaining, these points are necessary: 1. That the defendants came lawfully by the goods, as either by delivery to him, or finding them. 2. That the plaintiff have a property. 3. That the goods themselves be of value. And 4. That they be ascertained in point of identity. Upon this, the jury, if they find for the plaintiff, assess the respective values of the several parcels detained, and also damages for the detension, and the judgment is conditional, that the plaintiff recover the said goods, or (if they cannot be had) their respective values, and also the damages for detaining them.

DETONATING JAR. It is frequently necessary in the analysis of some gasses, to take the electric spark on given quantities in close vessels, such as mixtures of oxygen and hydrogen, which last forms the eudiometer of Volta, and bears his name. It consists of a thick glass tube quite open at bottom, and near the top are two perforations, in which small wires are cemented, that approach each other within the jar near enough to communicate the electric spark from an adjoining machine, whereby the inclosed gasses are fired. In most cases it is used with mixtures of gasses that detonate strongly when fired, which is attended with some inconveniences. If the jar in which the experiment is fired be closely stopped, a very small quantity of hydrogen and oxygen will burst pretty thick glass; and if it be entirely open, so that all the force of the explosion may be spent on the liquid in which the lower end is immersed, a good deal of it (especially if it be quicksilver) is thrown out and dispersed to a distance. These inconveniences are entirely remedied by the detonating jar, described here as invented by Mr. Pepys, in which the jar is supported by a heavy iron stand, which has a strong spring near the foot, that draws out in the manner of the steel-yard, when the concussion is given; and thus, much larger quantities may be safely detonated than can be done by the common apparatus, without spilling any of the quicksilver.

DETONA'TION. (*detonatio*, from *detono*, to make a noise.) The noise produced by the explosion of nitre, or substances containing nitre, when heated, which is greater or less, according to the manner and quantity of the composition, the sudden or gradual application of the heat, the coolness of the vessels, &c.

To **DETONIZE.** *v. a.* (from *detono*, Lat.) To calcine with detonation (*Arbuthnot*).

To **DETO'RT.** *v. a.* (*detortus*, Latin.) To wrest from the original import (*Dryden*).

To **DETRA'CT.** *v. a.* (*detractum*, Latin.) 1. To derogate; to take away by envy, calumny, or censure (*Bacon*). 2. To take away; to withdraw (*Boyle*).

DETRA'CTER. *s.* (from *detract.*) One that takes away another's reputation (*Swift*).

DETRA'CTION. *s.* (*detractio*, Lat.) The withdrawing or taking off from a thing; the impairing or lessening a man in point of fame (*Ayliffe*).

DETRA'CTORY. *a.* (from *detract.*) Defamatory by denial of desert; derogatory (*Brown*).

DETRA'CTRESS. *s.* (from *detract.*) A censorious woman (*Addison*).

DETRAHENS QUADRATUS. See PLATYSMA MYOIDES.

DETRANCHE, in heraldry, a line bendwise, proceeding always from the dexter side, but not from the very angle, diagonally athwart the shield.

DE'TRIMENT. *s.* (*detrimentum*, Latin.) Loss; damage; mischief; harm (*Evelyn*).

DETRIME'NTAL. *a.* (from *detriment.*) Mischievous; harmful; causing loss (*Addison*).

DETRI'TION. *s.* (*detero*, *detritus*, Latin.) The act of wearing away.

To **DETRU'DE.** *v. a.* (*detrudo*, Latin.) To thrust down; to force into a lower place (*Davies*).

To **DETRU'NCATE.** *v. a.* (*detrunco*, Lat.) To lop; to cut; to shorten.

DETRUNCA'TION. *s.* (from *detruncate.*) The act of lopping or cutting.

DETRU'SION. *s.* (*detrusio*, Lat.) The act of thrusting or forcing down (*Keil*).

DETRUSOR URINÆ. The muscular coat of the urinary bladder was formerly so called.

DETTINGEN, a village of the circle of the Upper Rhine, in Germany. The Austrians and English repulsed the French in 1743, at this place. It is four miles W. of Aschaffenburg. Lat. 49 55 N. Lon. 9. 5 E.

DETURBA'TION. *s.* (*deturbo*, Lat.) The act of throwing down; degradation.

DEVASTA'TION. *s.* (*devasto*, Latin.) Waste; havock; desolation; destruction (*Garth*).

DEUCALION, in mythology, was the son of Prometheus, who married Pyrrha, the daughter of Epimetheus. Some have supposed that Deucalion, whom the Greeks have represented under a variety of characters, and concerning whom their poets have given many fabulous accounts, was the same with the patriarch Noah; and that Deucalion's flood in Thessaly, as well as that of Ogyges in Attica, and of Prometheus in Egypt, were the same with that of Noah, recorded in Scripture. Diodorus Siculus expressly says, that in the deluge which happened in the time of Deucalion, almost all flesh died. Apollodorus having mentioned Deucalion εν-λαρνακι, consigned to an ark, takes notice, upon his quitting it, of his offering up an immediate sacrifice, Διι φυξιω, to the God who delivered him. As he was the father of all mankind, the ancients have given him great dignity and universal monarchy; though sometimes he is reduced to a petty king of Thessaly. Apollonius Rhodius makes him a native of Greece, and the son of Prometheus. We may learn, however, from their confused history, that the person represented was the first of men, through whom religious rites were renewed, cities built, and civil polity established in the world: none of which circumstances are applicable to any king of Greece. Philo assures us, that the Grecians call the person Deucalion, but the Chaldæans style him Noe, in whose time there happened the great eruption of waters. But as Lucian has given us the most particular history of the deluge, and that which comes nearest to the account given by Moses; and as he was a native of Samosata, a city of Commagene upon the Euphrates, a part of the world where memorials of the deluge were particularly preserved, and where an obvious reference to that history may be observed in the rites and worship of the country, we shall here give an extract from what he says on the subject.

Having described Noah under the name of Deucalion, he says that the present race of mankind are different from the men who first existed; for those of the antediluvian world were all destroyed. The present world is peopled from the sons of Deucalion; having increased to so great a number from one person. In respect to the former brood, they were men of violence, and lawless in their dealings. They regarded not oaths, nor observed the rites of hospitality, nor shewed mercy to those who sued for it. On this account they were doomed to destruction; and for this purpose there was a mighty eruption of waters from the earth, attended with heavy showers from above; so that the rivers swelled, and the sea overflowed, till the whole earth was covered with a flood, and all flesh drowned. Deucalion alone was preserved to repeople the world. This mercy was shewn to him on account of his justice and piety. His preservation was effected in this manner: he put all his family, both his sons and their wives, into a vast ark which he had provided, and he went into it himself. At the same time animals of every species, boars, horses, lions, serpents, whatever lived upon the face of the earth, followed him by pairs; all which he received into the ark, and experienced no evil from them; for there prevailed a wonderful harmony throughout by the immediate influence of the Deity. Thus were they wafted with him, as long as the flood endured.

After this he proceeds to mention, that upon the disappearing of the waters, Deucalion went forth from the ark, and raised an altar to God. Diod. Sic. lib. i. p. 10. Apollod. lib. i. p. 20. Apollon. Rhod. lib. iii. v. 1085. Philo Jud. de Præmio & Pœna, vol. ii. p. 412. Lucian de Deâ Syriâ, vol. ii. p. 882. Ovid Metamorp. i. 260, 320, &c.

Dr. Bryant produces a variety of monuments, that bear an obvious reference to the deluge, in the Gentile History, besides this account of Deucalion and his flood. Analysis of Ancient Mythology, vol. ii. p. 193—250.

DEUCE. *s.* (*deux*, French.) Two (*Shakspeare*).

To DEVE'LOP. *v. a.* (*developer*, French.) To disengage from something that enfolds and conceals; to disentangle (*Pope*).

DEVENTER, a city of the United Provinces, the capital of Overyssel, with a university. Lat. 52. 18 N. Lon. 5. 56 E.

DEVEREUX (Robert), earl of Essex, the son of Walter Devereux, viscount Hereford, was born at Netherwood, in Herefordshire, in the year 1567. He succeeded to the title of earl of Essex at ten years of age; and about two years after was sent, by his guardian lord Burleigh, to Trinity-college in Cambridge. He took the degree of master of arts in 1582, and soon after retired to his seat at Lampsie, in South Wales. He did not, however, continue long in this retreat; for we find him, in his seventeenth year, at the court of queen Elizabeth, who immediately honoured him with singular marks of her favour. Authors seem very unnecessarily perplexed to account for this young earl's gracious reception at the court of Elizabeth. The reasons are obvious: he was her relation, the son of one of her most faithful servants, the son-in-law of her favourite Leicester, and a very handsome and accomplished youth. Towards the end of (the following year) 1585, he attended the earl of Leicester to Holland; and gave signal proofs of his personal courage during the campaign of 1586, particularly at the battle of Zutphen, where the gallant Sidney was mortally wounded. On this occasion the earl of Leicester conferred on him the honour of knight banneret. After this period he rose rapidly in royal favour; and this elevation naturally affected the young earl, so that he grew petulant and vain; it also very naturally produced enemies and rivals in other courtiers of that day: after many artful contrivances, related in the histories of the reign of Elizabeth, but too numerous to detail here, they at length completely effected his ruin. Being of a haughty disdainful spirit, he could ill brook some slights which he received from the queen; but hastily and angrily made use of some unjustifiable expressions respecting her majesty. His enemies having intelligence of all his actions and speeches, sent for him to attend the council, which he refused, and began to arm in his own defence. Some blood was shed before he surrendered, upon which he was made close prisoner, arraigned before his peers, and sentenced to be beheaded; which was executed February 25, 1601.

DEVE'RGENCE. *s.* (*devergentia*, Latin.) Declivity; declination.

To **DEVE'ST.** *v. a.* (*devester*, French.) 1. To strip; to deprive of clothes (*Denham*). 2. To take away any thing good (*Bacon*). 3. To free from any thing bad (*Prior*).

DEVE'X. *a.* (*devexus*, Latin.) Bending down; declivous; incurvated downward.

DEVE'XITY. *s.* (from *devex.*) Incurvation downward; declivity.

To **DE'VIATE.** *v. n.* (*de via decedere*, Lat.) 1. To wander from the right or common way (*Pope*). 2. To go astray; to err; to sin; to offend.

DEVIATION. *s.* (from *deviate.*) 1. The act of quitting the right way; errour; wandering (*Cheyne*). 2. Variation from established rule *Holder*). 3. Offence; obliquity of conduct (*Clarissa*).

Deviation, in the old astronomy, a motion of the deferent, either toward or from the ecliptic.

Deviation of a falling body, from the vertical line, is a necessary consequence of the earth's rotation. To comprehend the reason of this phenomenon, imagine a heavy body placed at a considerable distance from the surface of the earth, at the summit of a high tower, for example. If the earth be immoveable, the body suffered to descend from the top will fall at the foot of the tower, according to the vertical direction; but if the earth turn on its axis, the body which participates in that motion will have a velocity of rotation greater than the bottom of the tower, because it is farther from the axis. Hence, when it descends with the motion compounded of that velocity, and the one produced by gravity, it will deviate a little from the vertical in the direction of the earth's motion, and consequently after its fall, it will be found a little to the eastward of the tower. This is confirmed by experience.

M. Guglielmini was the first who called the attention of philosophers to this subject. On causing heavy bodies to fall from an altitude of 241 feet, he found a deviation of eight lines towards the east of the vertical. M. Benzenberg, professor of physics and astronomy at Dusseldorp, made 28 experiments with balls well turned and polished, which were made to fall from a height of 262 French feet: at a medium they produced five lines of deviation towards the east, according to the determination of the plumb-line, and the theory gives four lines six-tenths. The last experiments made at Bologna, by M. Guglielmini, gave nearly the same results: yet so many are the causes that may destroy the accuracy of the experiments, and so trifling the deviation required by the theory, that we confess we are not inclined to lay much stress upon the results of these philosophers. Of the truth of the theoretic investigations, however, there can be no doubt: we shall, therefore, give here M. Laplace's ultimate theorem. Let h be the height from which the body falls, $g =$ double the space gravity causes a body to descend in the first second from quiescence, $n =$ the angle of the earth's rotation in the same time, at the rate of $360° \div 0{\cdot}99727$ in a day, and $\theta =$ the colatitude of the place, and $\Delta =$ the deviation towards the east: then, we have $\Delta = \frac{1}{3} nh \sin.\, \theta \sqrt{\frac{2h}{g}}$. (*Bulletin des Sciences*, No. 75.)

DEVI'CE. *s.* (*devise*, French.) 1. A contrivance; a stratagem (*Atterbury*). 2. A design; a scheme formed; project; speculation (*Hooker*). 3. The emblem on a shield (*Prior*). 4. Invention; genius (*Shakspeare*).

DEVIL. (*Diabolus*), an evil angel, one of those celestial spirits cast down from heaven for pretending to equal himself with God. There is no mention of the word devil in the Old Testament, but only of the word Satan and Belial: nor do we meet with it in any heathen authors, in the sense in which it is taken among Christians, that is, as a creature revolted from God. Their theology went no farther than to evil genii or dæmons. Some of the American idolaters have a notion of two collateral independent beings, one of whom is good, and the other evil; which last they imagine has the direction and superintendance of this earth, for which reason they chiefly worship him; whence those that give us an account of the religion of these savages give out, with some impropriety, that they worship the devil. The Chaldeans, in like manner, believed both a good principle and an evil one; which last they imagined was an enemy to mankind. Isaiah, speaking, according to some commentators, of the fall of the devil, calls him Lucifer, from his former elevation and state of glory: but others explain this passage of Isaiah in reference to the king of Babylon, who had been precipitated from his throne and glory. The Arabians call Lucifer, Eblis; which some think is only a diminutive or corruption of the word Diabolus.

The Greek word Διαβολος, meaning primarily an accuser or slanderer, is, according to Parkhurst, applied to the devil, because he originally accused or slandered God in Paradise, as averse to the increase of man's knowledge and happiness (see Gen. iii. 5. John viii. 44.), and still slanders him by false and blasphemous suggestions; and because, on the other hand, he is the accuser of our brethren, which "accuseth them before our God day and night," Rev. xii. 9, 10. (Comp. Job i. 6.); whence also he is called our adversary, αντιδικος, 1 Pet. v. 8. Farther, Διαβολος is used either for the prince of the evil spirits, as in Mat. iv. 1. Rev. xii. 9. xx. 2.; or, for those evil spirits in general. And Christ calls Judas Διαβολος, John vi. 70, because under the influence of that malignant spirit, he would turn his accuser and betrayer.

By this same Greek word, the LXX constantly render the Hebrew שטן, when meaning Satan or the devil (see Job, ch. i. ii.), and from them no doubt it is that the writers of the New Testament have so commonly used it in that sense, in which it likewise occurs, Wisd. ii. 24.

Devil's dung. See Assafœtida.

Devil-in-a-bush. In botany. See Nigella.

Devil's bit. See Scabiosa.

DE'VILISH. *a.* (from *devil.*) 1. Partaking of the qualities of the devil; diabolical; mischievous (*Sidney*). 2. An epithet of abhorrence or contempt (*Shakspeare*).

DE'VILISHLY. *ad.* In a manner suiting the devil; diabolically (*South*).

DE'VIOUS. *a.* (*devius*, Lat.) 1. Out of the common track (*Holder*). 2. Wandering; roving; rambling (*Thompson*). 3. Erring; going astray from rectitude (*Rowe*).

To DEVI'SE. *v. a.* (*deviser*, French.) To contrive; to form by art; to invent (*Peacham*).

To DEVI'SE. *v. n.* To consider; to contrive.

DEVISE, or DEVICE, in heraldry, painting, and sculpture, any emblem used to represent a certain family, person, action, or quality; with a suitable motto, applied in a figurative sense.

DEVISE, in law, the act whereby a person bequeaths his lands or tenements to another, by his last will and testament. The person who makes this act is called the devisor, and he in whose favour the act is made is termed in law the devisee.

To DEVI'SE. *v. n.* (from the noun.) To grant by will.

DEVI'SER. *s.* (from *devise.*) A contriver; an inventer (*Grew*).

DEVI'SOUR. *s.* (from *devise.*) He that gives by will.

DE'VITABLE. *a.* (*devitabilis*, Lat.) Possible to be avoided; avoidable.

DEVITA'TION. *s.* (*devitatio*, Lat.) The act of escaping or avoiding.

DEVIZES, a borough in Wiltshire, with a market on Thursday, and a manufacture of serges, and other woollen stuffs. It contains 1593 houses, 7910 inhabitants, and sends two members to parliament. Lat. 51. 20 N. Lon. 2. 2 W.

DEVO'ID. *a.* (*vuide*, Fr.) 1. Empty; vacant; void (*Spenser*). 2. Without any thing; free from (*Dryden*).

DEVO'IR. *s.* (*devoir*, French.) 1. Service: not in use (*Knolles*). 2. Act of civility or obsequiousness (*Pope*).

To DEVO'LVE. *v. a.* (*devolvo*, Lat.) 1. To roll down (*Thomson*). 2. To move from one hand to another (*Addison*).

To DEVO'LVE. *v. n.* To fall in succession into new hands (*Decay of Piety*).

DEVOLU'TION. *s.* (*devolutio*, Latin.) 1. The act of rolling down (*Woodward*). 2. Removal successive from hand to hand.

DEVONSHIRE, a county of England, bounded on the south by the English channel, on the north by the Bristol channel, on the east by Somersetshire, and on the west by Cornwall. It is about 69 miles long, and 66 broad. The soil is various; in the western parts of the county it is coarse and moorish, bad for sheep, but proper for black cattle. The southern parts have plenty of grass and corn, and may be called the garden of Devonshire: but in the north and west the land is more over-run with hills and moors. The county in general is well watered with rivers and brooks, which abound with fish, and the sea produces herrings and pilchards, which are of great advantage for home consumption, and for exportation abroad. There are chalybeate and other mineral waters.

Devonshire contains about 775,000 acres of land, nearly 300,000 of which are uncultivated, including woodlands. It lies in the diocese of Exeter; contains 33 hundreds, 1 city, 37 market towns, 394 parishes, 61,190 houses, 343,000 inhabitants, and sends 26 members to parliament. The principal rivers are the Tamar, Ex, Teigne, and Dart. Exeter is the chief town. This county furnishes 1512 men to the national militia.*

DEVONSHIRING, in agriculture, a name formerly applied to the process of paring and burning.

DEVORA'TION. *s.* (from *devoro*, Latin.) The act of devouring.

To DEVO'TE. *v. a.* (*devotus*, Lat.) 1. To dedicate; to consecrate (*Shakspeare*). 2. To addict; as to a sect, or study (*Watts*). 3. To condemn; to resign to ill (*Pope*). 4. To addict; to give up to ill (*Grew*). 5. To curse; to execrate (*Dryden*).

DEVO'TEDNESS. *s.* (from *devote.*) The state of being devoted or dedicated (*Boyle*).

DEVOTE'E. *s.* (*devot*, French.) One erroneously or superstitiously religious; a bigot.

DEVO'TION. *s.* (*devotion*, French. 1. The state of being consecrated or dedicated. 2. Piety; acts of religion (*Dryden*). 3. An act of external worship (*Hooker*). 4. Prayer; expression of devotion (*Spratt*). 5. The state of the mind under a strong sense of dependance upon God; piety (*Law*). 6. An act of reverence, respect, or ceremony (*Shakspeare*). 7. Strong affection; ardent love (*Clarendon*). 8. Earnestness; ardour (*Shakspeare*). 9. Disposal; power (*Clarendon*).

DEVOTION, among the Romans, was a sort of sacrifice, or ceremony, whereby they consecrated themselves to the service of some person. The ancients had a notion, that the life of one might be redeemed by the death of another: and hence were those devotions so frequent for the lives of the emperors.

DEVO'TIONAL. *a.* (from *devotion.*) Pertaining to devotion; religious (*K. Charles*).

DEVO'TIONALIST. *s.* (from *devotion.*) A man zealous without knowledge.

To DEVOU'R. *v. a.* (*devoro*, Lat.) 1. To eat up ravenously (*Shakspeare*). 2. To destroy or consume with rapidity and violence (*Joel*). 3. To swallow up; to annihilate (*South*). 4. To enjoy with avidity (*Dryden*).

DEVOU'RER. *s.* (from *devour.*) A consumer; he that devours (*Decay of Piety*).

DEVOU'T. *a.* (*devotus*, Latin.) 1. Pious; religious (*Rogers*). 2. Filled with pious thoughts (*Dryden*). 3. Expressive of devotion or piety (*Milton*).

DEVOU'TLY. *ad.* (from *devout.*) Piously; with ardent devotion; religiously (*Addison*).

DEUSE. *s.* (from *Dusius*, the name of a species of evil spirits.) The devil: a ludicrous word.

DEUTEROCANONICAL, in the school

theology, an appellation given to certain books of Holy Scripture, which were added to the canon after the rest; either because they were not wrote till after the compilation of the canon, or because of some disputes as to their canonical authority. The word is Greek; being compounded of δευτερος, second, and κανονικος, canonical. The Jews, it is certain, acknowlege several books in their canon, which were put there later than the rest. They say, that, under Ezra, a great assembly of their doctors, which they call, by way of eminence, the great synagogue, made the collection of the sacred books, which we now have in the Hebrew Old Testament: and they agree, that they put books therein which had not been so before the Babylonish captivity. Such are those of Daniel, Ezekiel, Haggai, &c. and those of Ezra and Nehemiah.

The deuterocanonical books, in the modern canon, are, the book of Esther, either the whole, or at least the seven last chapters of it; the epistle to the Hebrews; that of James; and that of Jude; the second of St. Peter; the second and third of St. John; and the Revelation. The deuterocanonical parts of books are, the hymn of the three children; the prayer of Azariah; the histories of Susanna, of Bel and the dragon; the last chapter of St. Mark; the bloody sweat, and the appearance of the angel, related in St. Luke, ch. xxii. and the history of the adulterous woman in St. John, ch. viii. See Canon.

DEUTERO'GAMY. *s.* (δευτερος and γαμος.) A second marriage.

DEUTERONOMY, one of the sacred books of the Old Testament; being the fifth book of the law, and the last of those written by Moses; closing, according to the computation of Usher, the history of 2552½ years, from the beginning of the world to the death of Moses. The word is Greek, compounded of δευτερος, second, and νομος, law. It does not appear that Moses made any division of what he wrote, into books; or that he gave different names and titles to the different parts of his work; nor do the Jews, even at this day, distinguish them in the copies they use in the synagogues, but write them all running as one single work, without any other distinction beside that of little and great parasches. It is true, in the other copies, used by private persons, they are divided into five parts, as among us; but they give them no other name, than the first word wherewith each division begins; much as we do in quoting a decree or chapter of the canon law.

The book of Deuteronomy was so called, because this last part of the work of Moses comprehends a repetition, or recapitulation, which that legislator made to the Israelites, before his death, of the law he had before delivered to them at large: and hence Deuteronomy is still called, by the rabbins, משנה *Mischneh*, repetition; משנה התורה repetition of the law, second law: they likewise call it תוכחות the Books of Reprimands; on account of the twenty-eighth chapter, which is full of blessings, promised to such as keep the law; and of curses, threatened to such as transgress it.

The book of Deuteronomy was written in the fortieth year after the delivery from Egypt, in the country of the Moabites beyond Jordan; Moses being then in the 120th year of his age. It contains, in Hebrew, eleven parasches, though only ten in the editions of the rabbins at Venice; 20 chapters, and 955 verses. In the Greek, Latin, and other versions, it contains 34 chapters: the last was not written by Moses. Some say, it was added by Joshua, immediately after Moses's death: others will have it added by Ezra, which is the most probable opinion; who likewise made some interpolations in the book itself, as chap. ii. ver. 12. chap. iii. 11, and 14.

DEUTEROPOTMI. (from δευτερος, *secundus*, and ποτμος, *fortuna*, or *mors*.) Among the Athenians, a designation given to such who had been thought dead, and, after the celebration of the funeral rites, unexpectedly recovered. It was unlawful for the deuteropotmi to enter into the temple of the Eumenides, or to be admitted to the holy rites, till after they were purified by being let through the lap of a woman's gown, that they might seem to be new born.

DEUTEROS, the Greek numerical term for the Ælian mode in music.

DEUTERO'SCOPY. *s.* (δευτερος and σκοπεω.) The second intention (*Brown*).

DEUTRIA, in botany, a genus of the class decandria, order trigynia. A Japan tree, with opposite branches; leaves opposite, ovate, pointed, serrate, rough; racemes terminal.

DEUX PONTS, or Zweybrucken, the capital of a duchy of the same name, in Germany. It was taken by the French in 1676, but given to the king of Sweden by the treaty of Ryswick. It is 50 miles S.W. of Mentz. Lat. 49. 10 N. Lon. 7. 26 E.

DEW, *ros*, a thin, light, insensible mist, or rain, ascending with a slow motion, and falling while the sun is below the horizon. Casaubon derives the word from the Greek δευω, I moisten. Naturalists usually rank dew among the number of meteors of the watery kind. Some define it a vapour liquified, and let fall in drops; others, a vapour having a like relation to frost, as rain has to snow, &c. Among the dissertations of Mons. Huet, is a letter to shew that dew does not fall, but rises. M. Gersten likewise adopted the same opinion. But it ought not to be disguised, that philosophers in general have been contented with very loose explanations on this subject. We are not aware that it would be consistent with our duty to record here any of the fanciful hypotheses which have been advanced: we shall, therefore, content ourselves with laying before our readers the account of the phænomena of dew given by M. C. A. Prieur, which is more ingenious and satisfactory than any we have seen.

This writer had recourse to three fundamental principles, formerly laid down by M. Mange, which are as follows: 1. The air in like circumstances dissolves more water the greater its density, that is to say, the more it is mechanically compressed. 2. And also more the higher its temperature. 3. Under equal pressure, and at like temperatures, air holding water in solution, has a less specific gravity than air alone; and this specific gravity is less the greater the proportion of water to be dissolved. It must also be recollected, that the changes of pressure and weight which may take place in certain columns of the atmosphere must necessarily disturb the equilibrium, and produce motion or currents in the same.

These principles being established, let us suppose for a moment, to render our enquiry more simple and easy, that the earth deprived of its rotatory motion, shall remain motionless in the presence of the sun, and let us besides dismiss from our consideration all local influence, and in general all those causes which might disturb the regularity of the effects. In this state of things, the air exposed to the rays of the sun will be heated, and principally in the part contiguous to the earth, on account of its greater density, and the reverberation of the planet. This heated air will acquire a greater dissolving power, and will, in fact, dissolve much water if that fluid be present. It will take it from the seas, lakes, rivers, ponds, and other reservoirs, whose surface is exposed to its action, and will even absorb a portion of the humidity of the ground.

Let us in the next place consider, what happens in any assumed vertical column in the atmosphere, and first in that placed immediately beneath the sun. The air heated at the lower part dissolving water, and thus becoming specifically lighter, will rise, and be replaced by other contiguous air. An ascending current will, therefore, be established in the column. If this column were separated from the others, as if it were contained in a vertical tube, in proportion as the lower air rose loaded with water, the upper air would descend, become charged in its turn; rise and be replaced; and that perpetually. And the air holding water in solution, would in consequence of under saturation from cold and diminished pressure, when it had arrived at a certain height, let fall the excess of water, and form a mist or cloud, which might continue to rise by virtue of its acquired motion, but which, after a certain accumulation, would fall again in rain. It may also be conceived, that this translation of the air upwards and downwards would be made either by a mutual infiltration, or currents in both directions, which would be constantly and regularly kept up.

But this is not entirely the case with our vertical column, because it is not in fact separated from the others in its vicinity. These also are subjected to the same operations, with the exception only, that the effects are less the more remote they are from the column immediately beneath the sun. The heat, the solution of water, and the force of ascension, gradually diminish as the distance from this central column increases. If, therefore, the surface of the earth were a plane, the proper representation of the rising air would be a cone with its summit directed to the sun; and on the other hand, as the absolute weight of each column is increased by the whole of the water it has dissolved, the equilibrium requires that there should be on all sides a lateral divergence, which must evidently take place where the pressure is least. Thus on the same supposition of the earth being a plane, we should observe the upper air descend and precipitate itself along the sides of the cone, producing by this oblique direction to the axis, a current in all sides directed from the sun; and this current would be increased by the vacuum formed at those places where the air is sufficiently elevated, and could precipitate its superabundant water. On applying this image to the exterior of our globe, the conical surface will be converted into a cap, enveloping the enlightened portion of the earth, and following the curvature produced by the currents.

The result of the supposed circumstances will be briefly thus: water dissolved by the lower air exposed to the sun; a motion of ascent in this part; descending divergent currents on all sides, spreading over the earth. These currents, moreover, communicate their water to the heated columns, which rise and diverge laterally; and this water is precipitated, because the air of the currents proceeding from the upper regions is too cold to keep it in solution, or because the pressure is less from the diminished weight of the columns, as their distance from the line immediately beneath the sun is greater, as well as because they may mix with other cold air near the surface; and, lastly, the ground, and all other bodies in the direction of this precipitated water, will be wetted therewith.

A few more remarks are necessary to complete the description. We must first observe that the descending currents are prolonged till the resistance of the air, through which they pass, has entirely destroyed their motion. Again, immediately beneath the sun there will be a circular space, considerably heated, which does not present to the inhabitants the phænomenon we have been describing. As we depart from this space, and in proportion as the sun appears in a more oblique direction, we arrive at a region less heated, where the wind from the direction of the sun, and the precipitation of moisture, begins to be perceived. This region forms a crown round the circular space before mentioned. And, lastly, by departing still more from the inner border of this crown, the wind is found to be stronger, the cold more perceptible, and the precipitation more abundant; which effects afterwards diminish to a certain distance, and entirely cease at the surface of the earth, diametrically opposite to the sun. In this manner, on the hypothesis of the immobility of the earth with regard to the sun, there would be beneath that luminary a very extended region, eternally and uninterruptedly subjected to the phænomenon of the morning and evening dew, according as the observer was placed to the east or the west.

But let us now assume the real state of things, and restore to the earth its diurnal rotation. The preceding phænomena will then take place on successive parts of its surface. Those places from which the sun is descending, and ready to set beneath the horizon, will soon perceive the appearance of the evening dew with a west wind springing up, which phænomena will increase gradually till after the setting of the sun, and then the effect will diminish and entirely cease. During the night the humidity will evaporate, and entirely disappear, provided the air be not already too much loaded with moisture. Towards the next morning just before day-break, the phænomenon will again present itself on the eastern side with the same circumstances and gradations, the maximum of effect being also when the sun is yet beneath the horizon; but with this remarkable difference, that the effects will be much stronger than those of the evening; that is, there will be more wind, more moisture deposited, and a more sensible degree of cold. The reason of this is, that in the evening the precipitation of water, the wind, and the cold *which accompany it, ought to be diminished,* because the whole takes place in the vicinity, and by the mixture of air which the sun has heated during the day; whereas, in the morning, the coldness of the night air permits, or gives a much greater effect to, the phænomenon.

We see, likewise, that in the two temperate zones, where the winter and summer have a great difference of temperature, where the length of days and nights vary much, the effects of the evening and morning dews are varied and irregular. In summer, if on the one hand the air dissolves more water in the day, on the other hand, the precipitation of the evening dew is made in the air very much heated, and that of the morning dew in air which the shortness of the night has cooled only to a certain point. In this case the solution of moisture is considerable, and the precipitation little. In winter, on the contrary, the cause of solution is less, but that of precipitation more effectual. Local circumstances, more especially the vicinity of water, must also influence the effects. Fine weather increases and renders them more sensible. Close weather weakens or destroys them.

Under the torrid zone, the days and nights are more nearly equal, and at the equator they are equal at all times. The difference between the summer and winter temperatures is less considerable than in our latitude, and the sky is almost constantly clear. It must follow that the morning and evening dews will be heavier under this burning climate, than elsewhere on the earth. And this agrees with the testimony of travellers. In Egypt, in Asiatic Turkey, at the Antilles, at Mexico, in vessels sailing between the tropics, the morning and evening dews fall so abundantly, that they produce the same effect as showers of rain.

But there is a very important consequence, which it seems allowable to draw from these phænomena; namely, that they must influence the production and permanence of the trade winds. For every day, almost regularly, the air of the torrid zone being solicited to move in two opposite directions by forces very different in quantity, it must tend, in fact, to acquire and preserve a motion or current, in the direction of that strongest power, which, in this case, is from the east, being the wind which brings the morning dew. This cause must be the more effectual, as it acts in the lower part of the atmosphere, where we feel the trade winds, and because it affects the densest portion, and consequently must the more readily move the whole.

Under the glacial zone, where, particularly during the winter, the sun scarcely skims the horizon through the whole day, the precipitation of water will be very considerable, by reason of the coldness of the climate, and a thick fog will prevail, which will scarcely be dissipated in summer; but in winter will extend far into the temperate zones. Thus we see, during the winter season, in our country, very considerable fogs, which have only a feeble light even in the middle of the day. (*Nicholson's Journal,* vol. iv. p. 90. 4to.)

Signor Beccaria made several experiments to demonstrate the existence of the electricity that is produced by dew. He observes in general, that such electricity took place in clear and dry weather, during which no strong wind prevailed; and that it depends on the quantity of the dew, as the electricity of the rain depends on the quantity of the rain. He sometimes found that it began before sun-set; at other times not till eleven o'clock at night. See his Artificial Electricity: Appendix, letter 3.

To Dew. *v. a.* (from the noun.) To wet as with dew; to moisten (*Spenser*).

DEWBERRY BUSH. In botany. See Rubus.

DEWBESPRE'NT. *part.* (*dew* and *besprent.*) Sprinkled with dew (*Milton*).

DE'WDROP. *s.* (*dew* and *drop.*) A drop of dew which sparkles at sunrise (*Tickel*).

DE WITT (John), the celebrated Dutch pensionary, born in 1625 at Dort, where he received his education. At the age of twenty-three, he published his Elementa Curvarum Linearum, a mathematical book of considerable merit. In 1650 he became pensionary of Dort, and soon distinguished himself as an able politician. He was very strenuous in opposing the war between the English and Dutch, and he afterwards laboured to bring about a peace with Cromwell, which was effected. In this treaty a secret article was inserted, for excluding the house of Orange, which brought considerable odium upon de Witt. However he was re-elected pensionary of Holland in 1663. In the war with England, that soon after followed, he was appointed one of the commissioners to direct the navy; and when Opdam was defeated, he was chosen one of the three to command the fleet, in which service he behaved so well as to receive the thanks of the States General. In 1667 he procured an edict to be passed for abolishing the office of stadtholder, which occasioned violent commotions, and laid the foundation of his ruin. He resigned his place of pensionary, and had the thanks of the States for his faithful services. The invasion of the French gave occasion to his enemies to represent him as a traitor to the country. Cornelius, the pensionary's brother, was imprisoned and condemned to exile; and a report being raised that he would be rescued, the mob armed, and surrounded the prison where the two brothers then were together, dragged them out, barbarously murdered them, hung their bodies on a gallows, and cut them to pieces, which many of them even broiled, and ate with savage fury. Such was the end of one of the greatest geniuses of his age; of whom sir William Temple, who was well acquainted with him, writes with the greatest esteem and admiration. He observes, that when he was at the head of the government, he differed nothing in his manner of living from an ordinary citizen. His office, for the first ten years, brought him in little more than 300*l.* and in the latter part of his life, not above 700*l.* per annum. He refused a gift of 10,000*l.* from the States General, because he thought it a bad precedent in the government. With great reason, therefore, sir William Temple, speaking of his death, observes, "He was a person that deserved another fate, and a better return from his country; after eighteen years spent in their ministry, without any care of his entertainments or ease, and little of his fortune.

man of unwearied industry, inflexible constancy, sound, clear, and deep understanding, and untainted integrity; so that whenever he was blinded, it was by the passion he had for that which he esteemed the good and interest of his state. This testimony is justly due to him from all that were well acquainted with him; and is the more willingly paid, since there can be as little interest to flatter, as honour to reproach, the dead." Besides the work already mentioned, he wrote a book containing those maxims of government upon which he acted; which will be a never-fading monument to his immortal memory. A translation of it from the original Dutch, intituled, The true Interest and Political Maxims of the Republic of Holland, has been printed in London; to the last edition of which, in 1646, are prefixed Historical Memoirs of the illustrious brothers Cornelius and John de Witt, by John Campbell, esq.

DE'WLAP. *s.* (from *lapping* or *licking* the dew.) 1. The flesh that hangs down from the throat of oxen (*Addison*). 2. The lip flaccid with age (*Shakspeare*).

DE'WLAPT. *a.* (from *dewlap.*) Furnished with dewlaps (*Shakspeare*).

DE'W-WORM. *s.* (from *dew* and *worm.*) A worm found in dew. See LUMBRICUS.

DE'WY. *a.* (from *dew.*) 1. Resembling dew; partaking of dew (*Milton*). 2. Moist with dew; roscid (*Dryden*).

DEXTANS. In antiquity. See AS.

DE'XTER. *a.* (Lat.) The right; not the left. A term in heraldry (*Shakspeare*).

DEXTE'RITY. *s.* (*dexteritas*, Latin.) 1. Readiness of limbs; activity; readiness to attain skill; expertness. 2. Readiness of contrivance (*Bacon*).

DE'XTEROUS. *a.* (*dexter*, Latin.) 1. Expert at any manual employment; active; ready (*Pope*). 2. Expert in management; subtle; full of expedients (*Locke*).

DE'XTEROUSLY. *ad.* Expertly; skilfully; artfully (*South*).

DEXTRÆ: the ancient Roman flute-players, who possessed the art of playing on two flutes at once, gave this name to the instruments fingered by the right hand: those which were fingered by the left hand were called *sinistræ*.

DEXTRAL. *a.* (*dexter*, Lat.) On the right side.

DEXTROCHERE, or DESTROCHERE, in heraldry, is applied to the right arm, painted in a shield, sometimes naked, sometimes clothed, or adorned with a bracelet, and sometimes armed, or holding some moveable, or member used in the arms.

DEY, the title of the sovereign of Algiers, under the protection of the grand seignor. A prince under this title was appointed by the sultan, at the request of the Turkish soldiers, in the year 1710.

DIA, Δια, the beginning of various terms in medicine, surgery, pharmacy, &c. Where these three letters commence the name of a remedy, unguent, plaster, cataplasm, &c. they signify composition and mixture; as in diapasma, diachylon, &c.

DIA is likewise the beginning of many terms in the other arts; as, diameter, dialogue, &c. on all which occasions, dia, which is an inseparable particle, or preposition, is borrowed from the Greek *δια*, *ex*, or *cum*; which begins the same words in the Greek.

Indeed we have words wherein dia is no preposition borrowed from a foreign language; though it is possible, the words themselves may: as in diamant, dial, &c.

DIA, in mythology, a goddess among the Romans, probably the same with Cybele.

DIABETES. (*diabetes*, διαβητης, from δια, through, and βαινω, to pass.) An immoderate flow of urine. It is a genus of diseases in the class neuroses, and order spasmi of Cullen. There are two species of this complaint: 1. diabetes serosus, in which there is a superabundant discharge of limpid urine, of its usual urinary taste: 2. diabetes mellitus, in which the urine is very sweet, and contains a great quantity of sugar. The diabetes is a disease which has of late years attracted a considerable degree of attention, and concerning which we shall treat more copiously under the article MEDICINE. We should, however, be wanting in that respect which is always due to real talents and merit, if we were not to notice under this head, that we are indebted for the most scientific and successful practice in this dangerous disease to the valuable experiments and ingenious suggestions of Dr. Rollo.

The doctor supposes, that in this complaint the vegetable matter taken into the stomach has not, from some defect in this organ, undergone a sufficient change to form proper chyle; that in consequence of this, much saccharine matter is evolved, which, when carried into the circulation, proves a general stimulus, producing head-achs and quickness of pulse, but that it acts more remarkably on the kidneys, occasioning a constant and copious secretion of sweet urine. From this hypothesis, he was naturally led to adopt a plan of cure, which in many cases has proved completely successful. The indications he lays down are: 1. To prevent the formation of saccharine matter in the stomach; and, 2. to remove the morbidly increased actions of this organ, and restore it to a healthful condition. These indications are to be answered by a complete diet of animal food, and by the use of such medicines as shall diminish the action of the stomach, and at the same time counteract the formation of saccharine matter. The remedies employed for this purpose have been emetics, kali sulphuratum, lime-water, hepatized ammonia, and vegetable narcotics. But the principal dependence is to be placed on a total abstinence from all vegetable matter, which alone can supply the saccharine principle. By a regular perseverance in this plan, several patients have experienced a complete cure.

DIABO'LIC, or DIABO'LICAL. *a.* (*diabolicus*, Lat.) Partaking of the qualities of the devil; extremely impious and wicked.

DIACAUSTIC CURVE, or the CAUSTIC

BY REFRACTION, is a species of caustic curves, the genesis of which is in the following manner. Imagine an infinite number of rays BA, BM, BD, &c. issuing from the same luminous point B, refracted to or from the perpendicular MC, by the given curve AMD; and so, that CE the sines of the angles of incidence CME, be always to CG the sines of the refracted angles CMG, in a given ratio: then the curve HFN that touches all the refracted rays AH, MF, DN, &c. is called the diacaustic, or caustic by refraction. See Plate 7, fig. 7.

DIACENTROS, in astronomy, the conjugate diameter of a planet's orbit.

DIACHYLON, in pharmacy, an emollient digestive plaster, composed of the mucilages or juices of certain herbs, litharge, and oil.

DIACODIUM, in pharmacy, a syrup prepared from the heads of poppies.

DIACOUSTICS, or DIAPHONICS, the consideration of the properties of sound refracted in passing through different mediums; that is, out of a denser into a more subtile, or out of a more subtile into a denser medium.

DIACRII, in antiquity, the name given to that faction or party at Athens who favoured an oligarchy, or would only have a few persons employed in the government. See PEDIACI.

DIADELPHIA. In botany. (from δις, twice, and αδελφος, a brother.) Two brotherhoods. The name of the seventeenth class, in Linnéus's Artificial System; comprehending those plants which bear hermaphrodite flowers, with two sets of united stamens. This is a natural class, with papilionaceous or pea flowers, and leguminous fruits. It is nearly the same with the papilionacei of Tournefort; the irregulares tetrapetalæ of Rivinus, and the leguminosæ of Ray. The orders are founded on the number of the stamens; and ten being the predominating number in this class, the order decandria is much the largest. The regular disposition of the stamens in this order is, nine united in one brotherhood, the lower broad part of the filament sheathing the germ; and the tenth single; but in almost twenty genera the ten stamens are connected into one body at bottom.

DIADELPHOUS STAMENS. Stamens forming two brotherhoods. The filaments united in each of the two sets at bottom, but separate at top.

DIADEM, in antiquity, a head-band or fillet, worn by kings as a badge of their royalty. It was made of silk, thread or wool, and tied round the temples and forehead, the ends being tied behind, and let fall on the neck. It was usually white, and quite plain; though sometimes embroidered with gold, and set with pearls and precious stones. In latter times, it came to be twisted round crowns, laurels, &c. and even appears to have been worn on various parts of the body.

DIADE'MED. *a.* (from *diadem.*) Adorned with a diadem; crowned (*Pope*).

DI'ADROM. *s.* (διαδρομεω.) The time in which any motion is performed (*Locke*).

DIÆ'RESIS. (διαιρεσις.) The separation or disjunction of syllables; as, aër.

DIÆ'RESIS. (*diæresis*, διαιρεσι; from διαιρεω, to divide or separate.) A solution of continuity of the soft parts of the human body.

DIÆTETÆ, in Grecian antiquity, from διαιταω, I arbitrate. Arbitrators; of which there were two sorts. The one, called cleroti, were public arbitrators chosen by lot, and from whose sentence appeal might be made: the other, called dialecterii, were private arbitrators, in smaller matters, and from whose sentence there was no appeal.

DIAGNOSIS. (*diagnosis*, διαγνωσιος; from διαγινωσκα, to discern or distinguish.) The science which delivers the signs by which one disease may be distinguished from another disease; hence those symptoms which distinguish such affections are termed diagnostic.

DIAGNOSIS, in botany, implies the affinity of the genus, and the difference or distinction of the species.

DIAGNO'STIC. *s.* (διαγινωσκω.) A symptom by which a disease is distinguished from others (*Collier*).

DIA'GONAL. *a.* (διαγωνιος.) Reaching from one angle to another (*Brown*).

DIAGONAL, in geometry, a right line drawn across a quadrilateral or other figure, whether plane or solid, from the vertex or summit of one angle to that of another.

It is demonstrable, 1. That every diagonal divides a parallelogram into two equal parts. 2. That two diagonals drawn in any parallelogram bisect each other. 3. A line passing through the middle point of the diagonal of a parallelogram, divides the figure into two equal parts. 4. The diagonal of a square is incommensurable with one of its sides. 5. The sum of the squares of the two diagonals of every parallelogram is equal to the sum of the squares of the four sides. 6. In any trapezium, the sum of the squares of the four sides is equal to the sum of the squares of the two diagonals together with four times the square of the distance between the middle points of the diagonals. 7. In any trapezium, the sum of the squares of the two diagonals is double the sum of the squares of two lines bisecting the two pairs of opposite sides. 8. In any quadrilateral inscribed in a circle, the rectangle of the two diagonals is equal to the sum of the two rectangles under the two pairs of opposite sides. 9. In every parallelopiped the sum of the squares of the four diagonals of the solid, is equal to the sum of the squares of its twelve edges. 10. In every hexaëdron, regular or not, the sum of the squares of the twelve edges, plus the sum of the squares of the twelve diagonals of the faces, is equal to three times the sum of the squares of the four diagonals which cross the solid, plus four times the sum of the squares of the six right lines which join, two by two, the middle points of those four latter diagonals. 11. In every polygon, and in every polyëdron, the sum of the squares of the lines which join two by two, the middle points both of sides and diagonals, is the quarter of the sum of the squares of those sides and diagonals; multiplied by the number of summits of the polygon or polyëdron, diminished by two units. 12. A farther generalization of the latter property leads to the most celebrated property of the centre of gravity. See Centre of gravity; also *Geometrie de position*, par M. Carnot, p. 332—337.

Diagonal scale. See Scale.

DIA'GONALLY. *ad.* (from *diagonal.*) In a diagonal direction (*Brown*).

DI'AGRAM. *s.* (διαγραμμα.) A delineation of geometrical figures; a mathematical scheme (*Dryden. Bentley*).

Diagram, or Diagramma, in the ancient music, was what we call the scale, or gammut, in the modern.

The extent of the diagramma, which they also called systema perfectum, was a disdiapason, or two octaves in the ratio 1 : 4. In that space they had eighteen chords, though these had not all different sounds.

Guido Aretine improved this scale, or diagram, very greatly: finding it of too small extent, he added five more chords, or notes, to it; laid them all down on a staff of five lines; and, instead of the long Greek names, named all his notes by Gregory's seven letters. See Notation.

The first, or lowest note of his scale, he marked Γ, and called gamma; whence the whole scale came to be denominated.

Dr. Pepusch observes, that the ancients considered a descending as well as an ascending scale; the former proceeding from acute to grave, precisely by the same intervals as the latter did from grave to acute, and the same name served for both. But the proslambanomenos, and the rest of the names, correspond to different notes of our scale. An example of one octave will explain the learned author's meaning.

Ascending		*Descending*
A	— Proslambanomenos	g
B	— Hypate hypaton	f
C	— Parypate hypaton	e
D	— Lichanos hypaton	d
E	— Hypate meson	c
F	— Parypate meson	b
G	— Lichanos meson	a
a	— Mese	G

The intervals here, both ascending and descending, are the same, and in the same order, viz. tone, semi-tone, tone, tone, semi-tone, tone, tone. So that the one scale is precisely the reverse of the other. This distinction of an ascending and a descending scale, is said to be conducive to the variety and perfection of melody, though little understood by modern composers. Phil. Trans. N°. 481. p. 369.

DIAGRY'DIATES. *s.* (from *diagrydium.*) Strong purgatives made with diagrydium. (*Floyer*).

DIAGRYDIUM, in pharmacy, is scammony prepared for medicinal use. See Pharmacy and Scammony.

DIAL, or Sun-dial, an instrument serving to measure time, by means of the shadow of the sun. The word is formed from *dies*, day, becouse indicating the hour of the day, (See Hour.) The ancients also call it sciathericum, from its doing it by the shadow.

Dial is more accurately defined, a draught, or description, of certain lines on a plane, or surface, of a body given, so contrived, as that the shadow of a style, or ray, of the sun, passed through a hole therein, shall touch certain points at certain hours.

The antiquity of dials is beyond doubt. Some attribute their invention to Anaximenes Milesius; and others to Thales. Vitruvius mentions one made by the ancient Chaldee historian Berosus, on a reclining plane, almost parallel to the equinoctial. Aristarchus Samius invented the hemispherical dial. And there were some spherical ones, with a needle for a gnomon. The discus of Aristarchus was an horizontal dial, with its limb raised up all round, to prevent the shadows stretching too far.

It was late ere the Romans became acquainted with dials. The first sun-dial at Rome was set up by Papirius Cursor, about the year of the city 460; before which time, says Pliny, there is no mention of any account of time but by the sun's rising and setting: it was set up at or near the temple of Quirinus; but being inaccurate, about 30 years after, another was brought out of Sicily by the consul M. Valerius Messala, which he placed on a pillar near the Rostrum; but neither did this shew time truly, because not made for that latitude; and, after using it 99 years, Martius Philippus set up another more exact.

The diversity of sun-dials arises from the different situation of the planes, and from the different figure of the surfaces upon which they are described; whence they become denominated equinoctial, horizontal, vertical, polar, direct, erect, declining, inclining, reclining, cylindrical, &c. For the general principles of their construction, see Dialling.

Dial-plate, the plate on which hours, or hour lines are marked.

DI'ALECT. *s.* (διαλεκτος.) 1. The subdivision of a language. 2. Style; manner of expression (*Hooker*). 3. Language; speech (*South*).

Dialect. (Διαλεκτος, from διαλεγεσθαι, to discourse.) The peculiar language of some province, or part, of a nation, formed by corruption of the general or national language.

Homer could speak five different languages in one verse, i. e. five dialects; viz. the Attic, Ionic, Æolic, the Doric, and the common dialect of the Greeks.

The Attic dialect is more particularly used by Xenophon and Thucydides; the Ionic by Herodotus and Hippocrates; the Doric by Pindar and Theocritus; the Æolic by Sappho and Alcea, and often by the two former writers.

The Bolognese, Bergamasque, Tuscan, &c. are the dialects of the Italian; the Gascon, and Picard, are dialects of the French

In Great Britain almost every county has a dialect of its own; all differing considerably in pronunciation, accent, and tone, though the language be the same.

There is an essential difference with regard to the use of the modern and of the Greek dialects. Thus, all England being subject to one government, the dialect of the court and of the metropolis is the only one usually committed to writing: but it was otherwise among the Greeks; for, as they were divided into a number of distinct sovereign states, the authors who flourished under these several governments wrote in the dialect of the country wherein they lived.

The inspired writers of the New Testament chiefly use the Attic dialect, which is remarkable for being elegantly simple, neat, and compact: on this account, the Biblical student will do well to acquaint himself thoroughly with the principal peculiarities of this dialect; for a description of which, we refer him to p.p. 71, 72, of the Introduction to Parkhurst's Greek Lexicon.

DIALECTICS, in the literary history of the ancients, that branch of logic which taught the rules and modes of reasoning. (See LOGIC.) Zeno Eleates was the first who discovered the natural series of principles and conclusions observed in reasoning, and formed an art thereof in form of a dialogue; which, for this reason, was called dialectica.

The dialectica of the ancients is usually divided into several kinds; the first was the eleatica, that of Zeno Eleates, which was threefold; viz. consecutionem, colloquntionum, and contentionum. The first consisted of rules for deducing or drawing conclusions. The second was the art of dialogue; which became of such universal use in philosophy, that all reasoning was called interrogation: then, syllogism being laid aside, the philosophers did all by diologue; it lying on the respondent to conclude and argue from the several concessions made The last part of Zeno's dialectics, Εριϛικη, was contentious, or the art of disputing and contradicting; though some, particularly Laertius, ascribe this part to Protagoras, a disciple of Zeno.

The second is the dialectica megarica, whose author is Euclid, not the mathematician, but another, of Megara. He gave much into the method of Zeno and Protagoras: though there are two things appropriated to him: the first, that he impugned the demonstrations of others, not by assumptions, but conclusions; continually making illations, and proceeding from consequence to consequence: the second, that he set aside all arguments drawn from comparisons of similitude as invalid. He was succeeded by Eubulides, from whom the sophistic way of reasoning is said to be derived. In his time the art is described as manifold: mentiens, fallens, electra, obvelata, acervalis, cornuta, and calva. See SOPHISM.

The third is the dialectics of Plato, which he proposes as a kind of analysis to direct the human mind, by dividing, defining, and bringing things to the first truth; where being arrived, and stopped there a little, it applies itself to explain sensible things, but with a view to return to the first truth, where alone it can rest. Such is the idea of Plato's analysis.

The fourth is Aristotle's dialectics; containing the doctrine of simple words, delivered in his book of Prædicaments; the doctrine of propositions, in his book De Interpretatione; and that of the several kinds of syllogism, in his books of Analytics, Topics, and Elenchuses.

The fifth is the dialectics of the Stoics; which they call a part of philosophy, and divide into rhetoric and dialectic; to which some add the definitive, whereby things are justly defined; comprehending likewise the canons or criterions of truth. The Stoics, before they come to treat of syllogisms, have two principal places: the one about the signification of words, the other about the things signified. On occasion of the first, they consider abundance of things belonging to the grammarian's province: what, and how many letters; what is a word, diction, speech, &c. On occasion of the latter, they consider things themselves, not as without the mind, but as in it, received in it by means of the senses. Accordingly, they first teach, that nil sit in intellectu, quod non prius fuerit in sensu; "whatever is in the mind came thither by the senses;" and that aut incursione sui, as Plato, who meets the sight; aut similitudine, as Cæsar by his effigy; aut proportione, either by enlarging as a giant, or by diminishing as a pigmy; aut translatione, as a Cyclops: aut compositione, as a Centaur; aut contrario, as death; aut privatione, as a blind man

The sixth is Epicurus's dialectics; for though he seems to have despised dialectic, he cultivated it with vigour. He was only averse to that of the Stoics, who, he thought, attributed too much to it, as pronouncing him alone wise who was well versed in dialectics. For this reason, Epicurus, seeming to set aside the common dialectics, had recourse to another way; viz. to certain canons which he substituted in their stead, the collection whereof he called canonica; and as all questions in philosophy are either de re or de voce, he gave separate rules for each. See EPICUREANS.

DIALE'CTICAL. *a.* (from *dialectick.*) Logical; argumental (*Boyle*).

DIALIA, ancient sacrifices to Jupiter.

DIALIS, something relating to Jupiter.

DIALITHA, in the writings of the ancients, is used to express the elegant ornaments of the Greeks and Romans composed of gold and gems.

DI'ALIST. *s.* (from *dial.*) A construction of dials (*Moxon*).

DI'ALIUM, in botany, a genus of the class diandria, order monogynia. Calyxless: corol five-petalled; stamens seated at the upper side of the receptacle. Two species: one an Indian tree with alternate pinnate leaves, and panicled flowers. The other a Guinea shrub with round branches; leaves alternate, pinnate, with an odd one; yellow flowers; and one-celled, one-seeded capsule, of the size of a cherry.

DIALLING, the art of drawing dials on the surface of any given body, whether plane or curved.

Dialling is wholly founded on the first motion of the heavenly bodies, and chiefly the sun; or rather on the diurnal motion of the earth: so that the elements of spherics, and spherical trigonometry, should be understood before a person advances to the doctrine of dialling. The doctrine or theory of dialling, we say; for, as to the practice, or the operations themselves, independent of the demonstrations, nothing is more easy and obvious.

The edge of the plane by which the time of the day is found is called the stile of the dial, which must be parallel to the earth's axis; and the line on which this plane is erected is called the substile. The angle included between the substile and stile is called the elevation or height of the style.

The principles of dialling may be aptly illustrated by the phenomena of a hollow or transparent sphere, as of glass. Thus suppose *a*PB*p* (fig. 1. Pl. 56.) to represent the earth as transparent; and its equator as divided into 24 equal parts by so many meridian semicircles *a*, *b*, *c*, *d*, *e*, &c. one of which is the geographical meridian of any given place, as London, which it is supposed is at the point *a*; and if the hour of 12 were marked at the equator, both upon that meridian and the opposite one, and all the rest of the hours in order on the other meridians, those meridians would be the hour circles of London: because, as the sun appears to move round the earth, which is in the centre of the visible heavens, in 24 hours, he will pass from one meridian to another in an hour. Then, if the sphere had an opake axis, as PE*p*, terminating in the poles P and *p*, the shadow of the axis, which is in the same plane with the sun and with each meridian, would fall upon every particular meridian and hour, when the sun came to the plane of the opposite meridian, and would consequently shew the time at London, and at all other places on the same meridian. If this sphere were cut through the middle by a solid plane ABCD in the rational horizon of London, one half of the axis EP would be above the plane, and the other half below it; and if straight lines were drawn from the centre of the plane to those points where its circumference is cut by the hour circles of the sphere, those lines would be the hour lines of an horizontal dial for London; for the shadow of the axis would fall upon each particular hour line of the dial, when it fell upon the like hour circle of the sphere.

If the plane which cuts the sphere be upright, as, AFCG, touching the given place, for ex. London, at F, (fig. 2.) and directly facing the meridian of London, it will then become the plane of an erect direct south dial; and if right lines be drawn from its centre E, to those points of its circumference where the hour circles of the sphere cut it, these will be the hour lines of a vertical or direct south dial for London, to which the hours are to be set in the figure, contrary to those on an horizontal dial; and the lower half E*p* of the axis will cast a shadow on the hour of the day in this dial, at the same time that it would fall upon the like hour circle of the sphere, if the dial plane was not in the way.

If the plane still facing the meridian, be made to incline, or recline, any number of degrees, the hour circles of the sphere will still cut the edge of the plane in those points to which the hour lines must be drawn straight from the centre; and the axis of the sphere will cast a shadow on these lines at the respective hours. The like will still hold, if the plane be made to decline by any number of degrees from the meridian towards the east or west; provided the declination be less than 90 degrees, or the reclination be less than the co-latitude of the place; and the axis of the sphere will be the gnomon: otherwise, the axis will have no elevation above the plane of the dial, and cannot be a gnomon.

Thus it appears that the plane of every dial represents the plane of some great circle on the earth, and the gnomon of the earth's axis; the vertex of a right gnomon the centre of the earth or visible heavens; and the plane of the dial is just as far from this centre as from the vertex of this stile. The earth itself, compared with its distance from the sun, is considered as a point; and therefore, if a small sphere of glass be placed upon any part of the earth's surface, so that its axis be parallel to the axis of the earth, and the sphere have such lines upon it, and such planes within it, as above described; it will shew the hours of the day as truly as if it were placed at the earth's centre and the shell of the earth were as transparent as glass. (Ferguson, lect. 10.)

There are several kinds of dials called universal, because they serve for all latitudes. One of a very ingenious construction has lately been invented by Mr. G. Wright of London. The hour circle, or arch E, and latitude-arch C, (fig. 3.) are the portions of two meridian circles; one fixed, and the other moveable. The hour or dial-plate SKI at top is fixed to the arch C, and has an index that moves with the hour circle E; therefore the construction of this dial is perfectly similar to the construction of the meridians and hour-circles upon a common globe. The peculiar problems to be performed by this instrument are, 1. To find the latitude of any place. 2. The latitude of the place being known, to find the time by the sun and stars. 3. To find the sun or stars altitude and azimuth.

Previous to use, this instrument should be in a well-adjusted state: to perform which, try the levels of the horizontal plates A*a*, by first turning the screws BBBB till the bubbles of air in the glass tubes of the spirit levels (which are at right angles to each other) are central, or in the middle, and remain so when the upper plate A is turned half round its centre; but if they should not keep so, there are small screws at the end of each level, which admit of being turned one way or the other as may be requisite, till they are so. The plates A*a* being thus made horizontal, set the latitude arch or meridian C steadily between the two grooved sides that hold it (one of which is seen at D) by the screw behind. On this side D is divided the nonius or vernier, corresponding with the divisions on the latitude arch C, and which may be subdivided into 5′ of a degree, and even less, if required. The latitude arch C is to be so placed in D, that the pole M may be in a vertical position, which is done by making 90° on the arch at the bottom coincide with *a* of the nonius. The arch is then fixed by the tightening screws at the back of D. Hang a silken plumb-line on the hook at G: which line is to coincide with a mark at the bottom of the latitude arch at H, all the while the upper plate A is moved round its centre. If it does not so, there are four screws to regulate this adjustment, two of which pass through the base I into the plate A: the other two screws fasten the nonius piece D together; which when unscrewed a thread or two, the nonius piece may be easily moved to the right or left of 90°, as may be found requisite.

Prob. I. *To find the latitude of the place.* Fasten the latitude and hour circles together, by placing the pin K into the holes; slide the nonius piece E on the hour-circle to the sun's declination for the given day. The nonius piece E must be set on that portion of the hour-circle marked ND or SD, according as the sun has north or south declination. About 20 minutes or a quarter of an hour before noon, observe the sun's shadow or spot that passes through the hole at the axis O, and gently move the latitude arch C down in its groove at D, till you observe the spot exactly fall on the cross line on the centre of the nonius piece at L; and by the falling of this spot so long as you observe the sun to increase in altitude, you depress the arch C: but at the instant of its stationary appearance the spot will appear to go no lower; then fix the arch by the screw at the back of D, and the degrees thereby cut by the nonius on the arch will be the latitude of the place required: if great exactness is wanted, allowance should be made for the refraction of the atmosphere, taken from some nautical or astronomical treatise.

Prob. 2. *The latitude of the place being given, to find the time by the sun or stars.* From an ephemeris as before, you find the sun's declination for the day north or south, and set the nonius piece E on the arch accordingly. Set the latitude arch C, by the nonius at D, to the latitude of the place; and place the magnifying glass at M, by which you will very correctly set the index carrying a nonius to the upper XII at S. Take out the pin K, slacken the horizontal screw N, and gently move, either to the right or left as you see necessary, the hour circle E, at the same time with the other hand moving the horizontal plate A round its axis to the right and left, till the latitude-arch C falls into the meridian; which you will know by the sun's spot falling exactly in the centre of the nonius piece, or where the lines intersect each other. The time may be now read off exactly to a minute by the nonius on the dial plate at top, and which will be the time required. The horizontal line drawn on the nonius piece L, is not seen in the figure, being the parallel of declination, or path that the sundial makes, it therefore can fall on the centre of that line at no other time but when the latitude arch C is in the meridian, or due north and south. Hence the hour-circle, on moving round with the pole, must give the true time on the dial-plate at top. There is a hole to the right, and cross hairs to the left, of the centre axis hole O, where the sun's rays pass through; whence the sun's shadow or spot will also appear on the right and left of the centre on the nonius piece L, the holes of which are occasionally used as sights to observe through. If the sun's rays are too weak for a shadow, a dark glass to skreen the eye is occasionally placed over the hole. The most proper time to find a true meridian is three or four hours before or after noon; and take the difference of the sun's declination from noon at the time you observe. If it be the morning, the difference is from noon of the preceding day; if afternoon, from noon of the following day: and the meridian being once found exact, the hour-circle E, is to be brought into this meridian, a fixed place made for the dial, and an object to observe by it also fixed for it at a great distance. The sights L, O, must at all times be directed against this fixed object, to place the dial truly in the meridian, proper for observing the planets, moon, or bright stars by night.

Prob. 3. *To find the sun's azimuth and altitude.* The latitude arch C being in the meridian, bring the pole M into the zenith, by setting the latitude-arch to 90°. Fasten the hour-circle E in the meridian by putting in the pin K; fix the horizontal plates by the screw N; and set the index of the dial-plate to XII, which is the south point: Now take out the pin K, and gently move the hour-circle E; leaving the latitude-arch fixed, till the sun's rays or spot passing through the centre hole in the axis O fall on the centre line of the hour-circle E, made for that purpose. The azimuth in time may be then read off on the dial-plate at top by the magnifying glass. This time may be converted into degrees, by allowing at the rate of 15 for every hour. By sliding the nonius piece E, so that the spot shall fall on the cross line thereon, the altitude may be taken at the same time, if it does not exceed 45 degrees. Or the altitude may be taken more universally, by fixing the nonius piece E to the 0 on the divisions, and sliding down the latitude-arch in such a manner in the groove at D, till the spot falls exactly on the centre of the nonius E. The degrees and minutes then shewn by the nonius at D, taken from 90, will be the altitude required. By looking through the sight holes L, O, the altitude of the moon, planets, and stars, may be easily taken. Upon this principle it is somewhat adapted for levelling also: by lowering the nonius piece E, equal altitudes of the sun may be had; and by raising it higher, equal depressions.

A dial better fitted for the performance of problems than the above, though in some particulars not so convenient and accurate, is made by Jones and other instrument-makers in London. It consists of the common equatorial circles reduced to a portable size, and instead of a telescope carrying a plain sight. Its principal parts consist of the sight-piece O P, fig. 4, moveable over the declination's simicircle D. It has a nonius Q to the simicircle. A dark glass to screen the eye applies occasionally over either of the holes at O: these holes on the inner side of the piece are intersected by cross lines; and to the sight P two pieces are fixed by a proper number of screws, the lower piece having a small hole for the sun's rays or shadow, and the upper two cross hairs or wires.

The declination circle or arch D is divided into two, 90° each; and is fixed perpendicularly on a circle with a chamfered edge, containing a nonius division that subdivides into single minutes the under equatorial circle MN, which in all cases represents the equator, and is divided into twice twelve hours, and each hour into five minutes. At right angles below this equatorial circle is fixed the simicircle of altitude AB, divided into two quadrants of 90° each. This arch serves principally to measure angles of altitude and depression; and it moves centrally on an upright pillar fixed in the horizontal circle EF. This circle EF is divided into four quadrants of 90° each, and against it there is fixed a small nonius plate at N. The horizontal circle may be turned round its centre or axis; and two spirit levels LL are fixed on it at right angles to one another.

We have not room to detail the great variety of astronomical and trigonometrical problems that may be solved by this general instrument; we therefore refer the reader to Jones's Instrumental Dialling.

The construction of sun-dials on all planes whatever may be included in one general rule, which will be quite intelligible, if that of a horizontal dial for any given latitude be well understood. For there is no plane, however obliquely situated with respect to any given place, but what is parallel to the horizon of some other place; and therefore, if we can find that other place by a problem on the terrestrial globe, or by a trigonometrical calculation, and construct a horizontal dial for it, that dial applied to the plane where it is to serve will be a true dial for that place.—Thus, an erect direct south dial in 51½° N. lat. would be a horizontal dial on the same meridian, 90° southward, which falls in with 38½° S. lat.: but if the upright plane declines from facing the south at the given place, it would be a horizontal plane 90° from that place; but for a different longitude, which would alter the reckoning of the hours accordingly.

Case I. Let us suppose that an upright plane at London declines 36° westward from facing the south, and that it is required to find a place to whose horizon the said plane is parallel; and also the difference of longitude between London and that place.

Let NESW (fig. 5.) be the horizon of London, whose zenith is Z, and P the north pole of the sphere; and let Z*h* be the position of a vertical plane at Z, declining westward from S (the south) by 36°; on which plane an erect dial for London at Z is to be described. Make the semidiameter ZD perpendicular to Z*h*; and it will cut the horizon in D, 36° west of S. Then a plane, in the tangent HD, touching the sphere in D, will be parallel to the plane Z*h*: and the axis of the sphere will be equally inclined to both these planes.

Let WQE be the equinoctial, whose elevation above the horizon of Z (London) is 38½°; and PRD the meridian of the place D, cutting the equinoctial in R. Then, it is evident that the arc RD is the latitude of the place D, (where the plane Z*h* would be horizontal) and the arc RQ is the difference of longitude of the planes Z*h* and DH.

In the spherical triangle WDR, the arc WD is given, for it is the complement of the plane's declination from S to south; which complement is 54° (viz. 90°—36°:) the angle at R, in which the meridian of the place D cuts the equator, is a right angle; and the angle RWD measures the elevation of the equinoctial above the horizon or Z, namely, 38½ degrees. Say therefore, As radius is to the cosine of the plane's declination from the south, so is the cosine of the latitude of Z to the sine of RD the latitude of D: which is of a different denomination from the latitude of Z, because Z and D are of different sides of the equator.

As radius to cosine, 36° 0′=RQ, so cosine 51° 30′=QZ to sine 30° 14′=DR=the lat. of D, whose horizon is parallel to the vertical plane Z*h* at Z.

N. B. When radius is made the first term, it may be omitted; and then by subtracting it mentally from the sum of the other two, the operation will be shortened. Thus, in the present case,

To the logarithmic sine of WR=54° 0′ add the logarithmic sine of RD=38° 30′ their sum—radius gives the same solution as above. And we shall keep to this method in the following part of this article.

To find the difference of longitude of the places D and Z, say, As radius is to the cosine of 38½ degrees, the height of the equinoctial at Z, so is the co-tangent of 36 degrees, the plane's declination, to the co-tangent of the difference of longitudes. Thus,

To the logarithmic sine of 51° 30′ add the logarithmic tang. of 54° 0′ their sum—radius is the nearest tangent of 47° 8′=WR: which is the co-tangent of 42° 52′=RQ, the difference of longitude sought. Which difference, being reduced to time, is 2 hours 51½ minutes.

And thus having found the exact latitude and longitude of the place D, to whose horizon the vertical plane at Z is parallel, we shall proceed to the construction of a horizontal dial for the place D, whose latitude is 30° 14′ south; but anticipating the time at D by 2 hours 51 minutes (neglecting the ½ minute in practice), because D is so far westward in longitude from the meridian of London; and this will be a true vertical dial at London, declining westward 36 degrees.

Assume any right line CSL, fig. 6. for the substile of the dial, and make the angle KCP equal to the latitude of the place (viz. 30° 14′), to whose horizon the plane of the dial is parallel; then CRP will be the axis of the stile, or edge that casts the shadow on the hours of the day, in the dial. This done, draw the contingent line EQ cutting the substilar line at right angles in K; and from K make KR perpendicular to the axis CRP. Then KG (=KR) being made radius, that is, equal to the chord of 60° or tangent of 45° on a good sector, take 42° 52′ (the difference of longitude of the places Z and D) from the tangents, and having set it from K to M, draw CM for the hour-line of XII. Take KN, equal to the tangent of an angle, less by 15 degrees than KM; that is, the tangent of 27° 52′: and through the point N draw CN for the hour-line of I. The tangent of 12° 52′ (which is 15° less than 27° 42′), set off the same way, will give a point between K and N, through which the hour-line of II is to be drawn. The tangent of 2° 8′ (the difference between 45° and 50° 52′) placed on the other side of CL, will determine the point through which the hour-line of III is to be drawn: to which 2° 8′, if the tangent of 15° be added, it will make 17° 8′; and this set off from K towards Q on the line EQ, will give the point for the hour-line of IV: and so of the rest.—The forenoon hour-lines are drawn the same way, by the continual addition of the tangents 15°, 30°, 45°, &c. to 42° 52′ (=the tangent of KM) for the hours of XI, X, IX, &c. as far as necessary: that is, until there be five hours on each side of the substile. The sixth hour, accounted from that hour or part of the hour on which the substile falls, will be always in a line perpendicular to the substile, and drawn through the centre C.

In all erect dials, CM, the hour-line of XII, is perpendicular to the horizon of the place for which the dial is to serve; for that line is the intersection of a vertical plane with the plane of the meridian of the place, both which are perpendicular to the plane of the horizon: and any line HO or *ho*, perpendicular to CM, will be a horizontal line on the plane of the dial, along which line the hours may be numbered; and CM being set perpendicular to the horizon, the dial will have its true position.

If the plane of the dial had declined by an equal angle towards the east, its description would have differed only in this, that the hour-line of XII would have fallen on the other side of the substile CL, and the line HO would have a subcontrary position to what it has in this figure.

And these two dials, with the upper points of their stiles turned towards the north pole, will serve for other two planes parallel to them; the one declining from the north toward the east, and the other from the north toward the west, by the same quantity of angle. The like holds true of all dials in general, whatever be their declination and obliquity of their planes to the horizon.

Case II. If the plane of the dial not only declines, but also reclines, or inclines. Suppose its declination from fronting the south S, fig. 7, be equal to the arc SD on the horizon; and its reclination be equal to the arc D*d* of the vertical circle DZ: then it is plain, that if the quadrant of altitude Z*d*D on the globe cuts the point D in the horizon, and the reclination is counted upon the quadrant from D to *d*: the intersection of the hour circle PR*d*, with the equinoctial WQE, will determine R*d*, the latitude of the place *d*, whose horizon is parallel to the given plane Z*h* at Z; and RQ will be the difference in longitude to the places at *d* and Z

Trigonometrically thus; Let a great circle pass through the three points, W, *d*, E; and in the triangle WD*d*, right-angled at D, the sides WD and D*d* are given; and thence the angle DW*d* is found, and so is the hypothenuse W*d*. Again, the difference, or the sum, of DW*d* and DWR, the elevation of the equinoctial above the horizon of Z, gives the angle *d*WR; and the hypothenuse of the triangle WR*d* was just now found; whence the sides R*d* and WR are found, the former being the latitude of the place *d*, and the latter the complement of RQ, the difference of longitude sought.

Thus, if the latitude of the place Z be 52° 10′ north; the declination SD of the plane Z*h* (which would be horizontal at *d*) be 36°, and the reclination be 15°, or equal to the arc D*d*; the south latitude of the place *d*, that is the arc R*d*, will be 15° 9′; and RQ, the difference of the longitude, 36° 2′. From these data, therefore, let the dial (fig. 8.) be described, as in the former example; only it is to be observed, that in the reclining or inclining dials, the horizontal line will not stand at right angles to the hour-line of XII, as in erect dials; but its position may be thus found:—To the common substilar line CKL on which the dial for the place *d* was described, draw the dial C*rpm* for the place D, whose declination is the same as that of *d*, viz. the arc SD; and HO, perpendicular to C*m*, the hour-line of XII on this dial, will be a horizontal line on the dial CPRM XII. For the declination of both dials being the same, the horizontal line remains parallel to itself, while the erect position of one dial is reclined or inclined with respect to the position of the other. Or the position of the dial may be found by applying it to its plane, so as to mark the true hour of the day by the sun, as shewn by another dial; or by a clock regulated by a true meridian line and equation table.

The other chief requisites in the practice of dialling we shall give either in the form of arithmetical rules, or algebraical theorems; as follows:

Rule I. To find the angles which the hour-lines on any dial make with the substile. To the logarithmic sine of the given latitude, or of the stiles of elevation above the plane of the dial, add the logarithmic tangent of the hour distance from the meridian, or from the substile (at the rate of 15° to an hour); and the sum minus radius will be the logarithmic tangent of the angle sought. N. B. In all horizontal dials, and erect north or south dials, the substile and the meridian are the same; but in all declining dials, the substilar line makes an angle with the meridian.

In fig. 6, KC is to KM in the ratio compounded of KC to KG (=KR) and of KG to KM; which, making CK the radius, 10000000, or 1, are the ratio of 10000000, or 1, to KG × KM. Thus, in a horizontal dial for latitude 51½°, to find the angular distance of XI in the morning, or of I in the afternoon, from XII. To the logarithmic sine of 51° 30′, add the logarithmic tang. of 15°, the sum − radius, is the logarithmic tangent of 11° 50′, or of the angle which the hour-line of XI or I, makes with the meridian. And, by computing in a similar manner, with the sine of the latitude, and the tangs. of 30°, 45°, &c. the angular distances of X or II, of IX or III, &c. from the meridian may be found; and may be easily laid down.

Rule II. The latitude of the place, the sun's declination, and his hour distance from the meridian, being given; to find (1.) *his altitude;* (2.) *his azimuth.*

1. Let *d* (fig. 7.) be the sun's place, *d*R his declination; and, in the triangle PZ*d*, P*d* the sum or the difference of *d*R, and the quadrant PR, being given by the supposition, as also the complement of the latitude PZ, and the angle *d*PZ, which measures the horary distance of *d* from the meridian; we shall (by Case 4. of Keill's Oblique Spheric Trigonometry) find the base Z*d*, which is the sun's distance from the zenith, or the complement of his altitude.

And (2.) as sine Z*d*: sine P*d*: : sine *d*PZ: *d*ZP, or of its supplement DZS, the azimuthal distance from the south.

Or the practical rule may be as follows:

Write A for the sine of the sun's altitude, L and *l* for the sine and cosine of the latitude, D and *d* for the sine and cosine of the sun's declination, and H for the sine of the horary distance from VI.

Then the relation of H to A will have three varieties.

1. When the declination is toward the elevated pole, and the hour of the day is between XII and VI; it is

$A = LD + Hld$, and $H = \dfrac{A - LD}{ld}$,

2. When the hour is after VI. it is $A = LD - Hld$, and $H = \dfrac{LD + A}{ld}$

3. When the declination is towards the depressed pole, we have $A = Hld - LD$, and $H = \dfrac{A + LD}{ld}$.

Which theorems will be found useful, and expeditious enough for solving those problems in geography and dialling which depend on the relation of the sun's altitude to the hour of the day. (*Ferguson's Lect.* 11.)

The chief writers on dials and dialling are the following: Vitruvius, in his Architecture, cap. 4. and 7. lib. 9: Sebastian Munster, in his Horolographia: John Dryander de Horologiorum varia Compositione: Conrade Gesner's Pandectæ: Andrew Schoner's Gnomonicæ: Fred. Commandine de Horologiorum Descriptione: Joan. Bapt. Benedictus de Gnomonum Umbrarumque Solarium Usu: Joannes Georgius Schomberg, Exegesis Fundamentorum Gnomonicorum: Solomon de Caus, Traité des Horologes Solaires: Joan. Bapt. Trolta, Praxis Horologiorum: Desargues, Maniere Universelle pour poser l'Essieu et placer les Heures et autres Choses aux Cadrans Solaires: Ath. Kircher, Ars magna Lucis et Umbræ: Hallum, Explicatio Horologii in Horto Regio Londoni: Tractatus Horologiorum Joannis Mark: Clavius, Gnomonices de Horologiis; in which he demonstrates both the theory and the operations after the rigid manner of the ancient mathematicians: Dechales, Ozanam, and Schottus, gave much easier treatises on this subject; as did also Wolfius in his Elementa: M. Picard gave a new method of making large dials, by calculating the hour lines; and M. De la Hire, in his Dialling, printed in 1683, gave a geometrical method of drawing hour lines from certain points, determined by observation. Everhard Walper, in 1625, published his Dialling, in which he lays down a method of drawing the primary dials on a very easy foundation; and the same foundation is also described at length by Sebastian Munster, in his Rudimenta Mathematica, published in 1651. In 1672, Sturmius published a new edition of Walper's Dialling, with the addition of a whole second part, concerning inclining and declining dials, &c. In 1708, the same work, with Sturmius's additions, was re-published, with the addition of a fourth part, containing Picard's and De la Hire's method of drawing large dials, which makes much the best and fullest book on the subject. Paterson, Michael, and Muller, have each written on Dialling, in the German language: Coetsius, in his Horologiographia Plana, printed in 1689: Gauppen, in his Gnomonica Mechanica: Leybourn, in his Dialling: Bion, in his Use of Mathematical Instruments: Wells, in his Art of Shadows. There is also a treatise by M. Deparceux, 1740. Mr. Ferguson has also written on the same subject in his Lectures on Mechanics, above quoted: besides, Emerson, in his Dialling; Leadbetter, in his Mechanic Dialling; Mr. W. Jones, in his Instrumental Dialling; and the learned bishop Horsley, in his Mathematical Tracts. Dr. Brewster has described, in the appendix to his valuable edition of Ferguson's Lectures, an analemmatic dial which sets itself: and many ingenious constructions of dials are given in Dr. Hutton's translation of Montucla's Recreations.

Dialling lines, or scales, are graduated lines, placed on rules, or the edges of quadrants, and other instruments, to expedite the construction of dials.

DIALOGISM, Διαλογισμος, in rhetoric, is used for the soliloquy of persons deliberating with themselves: in which sense it is distinguished from dialogue.

DIA'LOGIST. *s.* (from *dialogus.*) A speaker in a dialogue, a writer of dialogues.

DI'ALOGUE. *s.* (διαλογος.) A conference; a conversation between two or more, either real or feigned (*Shakspeare*).

Dialogue, a vocal or instrumental composition of two parts, in which the performers, for the most part, sing or play alternately, but occasionally unite. Opera scenes, especially those of the Italian drama, are frequently conducted upon this plan; and in situations of either humour or passion are found capable of the most striking effects.

DIA'LYSIS. (*dialysis*, διαλυσις; from a διαλυω, to dissolve). A solution of continuity, or a destruction of parts. An order in the class locales of Cullen's nosology is termed dialyses.

Dialysis, in grammar, a mark or character, consisting of two points, ¨, placed over two vowels of a word, to separate them, otherwise they would make a diphthong, as Mosäic, &c. See Diæresis.

DIAMASTIGOSIS, a festival at Sparta in honour of Diana Orthia, which received that name απο του μαςιγουν, from whipping, because boys were whipped before the altar of the goddess These boys, called bomonicæ, were originally free-born Spartans, but in the more delicate ages they were generally of a slavish origin. The parents of the children commonly attended the solemnity, and exhorted them not to give the least sign of pain or concern; though some of them were so severely lashed as to die upon the spot.

DIA'METER. *s.* (δια and μετρον.) The line which, passing through the centre of a circle, or other curvilinear figure, divides it or its respective ordinates into equal parts. See Curve.

Diameter (Transverse), of a conic section, is a line drawn through the foci to the curve, or which bisects parallel right lines between the curves.

Diameter (Conjugate), when used in the singular, denotes what is more properly called the conjugate axis: when used in the plural, conjugate diameters, are such diameters as are each parallel to the tangent at the vertex of the other.

Diameter of gravity, is a right line passing through the centre of gravity.

Diameter of a column, in architecture, its thickness just above the base. Half of this is generally reckoned the module, and commonly, though not always, divided into 30 parts called minutes. See Module.

Diameter, in astronomy. The diameters of the heavenly bodies are either apparent, i. e. such as they appear to the eye; or real, i. e. such as they are in themselves.

The apparent diameters measured with a micrometer are found different, in different circumstances and parts of their orbits. These are the angles under which the diameters of the planets are seen from the earth; and they are equal to the real diameters divided by the distance from the earth: or, as these angles are very small, the diameters may be taken for arcs of a circle described on the eye as a center, with a radius equal to the distance of the planets; and they are said to consist of as many minutes and seconds as those angles consist of: therefore the apparent diameters of a planet are in the inverse ratio of their real distances. The sun's vertical diameter is found by taking the height of the upper and lower edge of his disk when he is in or near the meridian; the height of each edge must be corrected by proper allowances for parallax and refraction, and the difference between the true height of the upper and lower edge is the true apparent diameter. This apparent diameter is found to vary from 32′ 38″ 6, in January, to 31′ 33″ 8, in July.... The apparent diameter of the moon varies from about 29′ 28″ to 33′ 30″ Her real diameter is about 2180 miles. The apparent diameters of the planets when at their respective mean distances from the earth are as follow: Mercury, 11″; Venus, 58″; Mars, 27″; Jupiter, 39″; Saturn, 18″; Georgium Sidus, 3″ 54‴. And from these apparent diameters, and the respective distances from the earth, the diameters of the sun and planets have been determined in English miles as here stated: Mercury, 3224; Venus, 7687; Mars, 4189; Jupiter, 89,170; Saturn, 79,042; Georgium Sidus, 35,112; the Sun, 883,246. Observations upon the planets Herschel, Saturn, Jupiter, and Mars, prove that there is a sensible difference between their equatoreal and polar diameters; and it is probable that there is a like difference between the diameters of the other planets, but this has not yet been determined by observation. The mean apparent diameters of the planets, as seen from the sun, have been thus given: Mercury, 20″; Venus, 30″; Earth, 17″; Mars, 10″; Jupiter, 37″; Saturn, 16″; Georgium Sidus, 4″. See ASTRONOMY.

DIA'METRAL. *a.* (from *diameter.*) Describing the diameter; relating to the diameter.

DIA'METRALLY. *ad.* According to the direction of a diameter (*Hammond*).

DIAME'TRICAL. *a.* (from *diameter.*) 1. Describing a diameter. 2. Observing the direction of a diameter (*Govern. of the Tongue*).

DIAME'TRICALLY. *ad.* (from *diametrical.*) In a diametrical direction (*Clarendon*).

DIAMOND, a precious stone of most costly value, for the mineralogical character of which see ADAMAS.

The art of cutting and polishing diamonds appears to have been known at a very early period to the inhabitants of Hindustan and China; the only material, however, that is used for this purpose in the east being corundum (*adamantinus*), and the apparatus being of extreme simplicity, the jewellers of these countries are incapable of bringing out the peculiar beauty of the diamond in a degree at all comparable to what is readily effected by European artists. The extreme hardness of this gem had baffled the attempts of the jewellers of Europe till the year 1456, when a young man named Lewis de Berguin, a native of Bruges, endeavoured to polish two diamonds by rubbing them against each other. He found that by this mean a facet was produced on the surface of the diamond, and in consequence of this hint constructed a polishing wheel, on which, by means of diamond powder, he was enabled to cut and polish this substance in the same manner as other gems are wrought by emery. Previous to this discovery diamonds were set in jewellery precisely in the state in which they arrived from India; and hence the regular octohedrons were much more esteemed than the rest, both on account of the regularity of the figure, and the superiority of its natural polish.

Diamonds are cut and manufactured by jewellers into brilliants and rose diamonds: the former being for the most part made out of the octohedral crystals, and the latter from the spheroidal varieties. To fashion a rough diamond into a brilliant the first step is to modify the faces of the original octohedron, so that the plane formed by a junction of the two pyramids shall be an exact square, and the axis of the crystal, or a line connecting the apices of the pyramids, and perpendicular to this common base, shall be precisely twice the length of one of the sides of the square. The octohedron being thus rectified, a section is to be made parallel to the common base or girdle, so as to cut off $\frac{5}{18}$ of the whole height from the upper pyramid, and $\frac{1}{18}$ from the lower one. The superior and larger plane thus produced is called the table, and the inferior and smaller one the collet: in this state it is called a complete square table diamond. To convert it into a brilliant two triangular facets are placed on each side of the table, thus converting from a square to an octagon; a lozenge-shaped facet is also placed at each of the four corners of the table, and another lozenge extending lengthways along the whole of each side of the original square of the table, which with two triangular facets set on the base of each lozenge, completes the whole number of facets on the table side of the diamond, viz. eight lozenges and twenty-four triangles: on the collet side are formed four irregular pentagons alternating with as many irregular lozenges, radiating from the collet as a centre, and bordered by sixteen triangular facets adjoining the girdle. The brilliant being thus completed is set with the table side upwards, and the collet side implanted in the cavity made to receive the diamond. The regular rose diamond is formed by inscribing a regular octagon in the centre of the table side of the stone, and bordering it by eight right-angled triangles, the bases of which correspond with the sides of the octagon; beyond these is a chain of eight trapeziums, and another of sixteen triangles. The collet side consists also of a minute central octagon, from every angle of which proceeds a ray to the edge of the girdle, forming the whole surface into eight trapeziums, each of which is again subdivided by a saliant angle, the apex of which touches the girdle, into one irregular pentagon and two triangles. In the formation of either a brilliant or rose diamond of regular proportions, so much is cut away that the weight of the polished gem is no more than half that of the rough crystal out of which it was formed, whence the value of a cut diamond is esteemed equal to that of a similar rough diamond of twice the weight, exclusive of the value of the workmanship. The weight, and consequently the value of diamonds, is estimated in carats, 150 of which are equivalent to 240 grains or 1oz. Troy, and the difference between the cost of one diamond and another, ceteris paribus, is as the squares of their respective weights. Thus the value of three diamonds of one, two, and three carats weight respectively, is as one, four, and nine. The average price of rough diamonds, that are worth working, is about 2 pounds sterling for the first carat, and consequently in wrought diamonds, exclusive of the cost of workmanship, the cost of the first carat is = 8l. hence a wrought diamond of

5 carats is worth	£ 200
10 ditto - -	800
20 ditto - -	3,200
30 ditto - -	7,200
40 ditto - -	12,800
50 ditto - -	20,000
60 ditto - -	28,800
70 ditto - -	39,200
80 ditto - -	51,200
90 ditto - -	64,800
100 ditto - -	80,000

This rule, however, actually holds good only in the smaller diamonds of twenty carats and under, the larger ones, in consequence of the scarcity of purchasers, being disposed of at prices greatly inferior to their estimated worth. The largest diamond at present known is in the possession of the emperor of Russia; it weighs 779 carats. The Pitt or Regent Diamond, the finest of the crown jewels of France, weighs 136 carats, and was purchased for 2,500,000 livres.

The mineralogical situation of the diamond is not well ascertained: it occurs in India in detached crystals, in a kind of indurated ochery gravel, but whether or not this is its native bed is unknown. The diamond mines of India are dispersed throughout the whole chain of the Ghauts from Bengal to Cape Comorin; many of these are however at present abandoned, the chief that are now worked being situated between Golconda and Mazulipatam. The earth which affords them being dug up and broken to pieces is carefully washed till the water comes off colourless, and the residue is spread thin on mats in the sun, where the diamonds are discovered by their superior brilliancy. This valuable gem is also procured from Borneo and from Brazil, in the mountainous district called Serro Dofrio, contained in alluvial beds of ferruginous sand.

The principal use of diamond is in ornamental jewellery; it is also employed by glaziers and lapidaries to cut glass, and engrave upon the harder gems; and in the finer kinds of clockwork.

Newton conjectured the diamond to be a combustible body. Guyton in 1785 inferred its similarity to charcoal, from its leaving an effervescent alkali, after combustion in fused nitre. Lavoisier found that on burning it in closed vessels it yielded carbonic acid. This has also been proved by Mr. Tennant, who performed the combustion in a crucible of gold. Berthollet considered it as crystallized charcoal. Since this, Guyton having burnt the diamond in oxygen gass, by the solar rays, and thereby having obtained carbonic acid without residue, he presumed that he had ascertained the diamond to be pure carbon, or the pure combustible matter of the carbonic genus, yielding the pure acidifiable basis of the carbonic acid. But it was Clouet who proposed the conclusive experiment of making soft iron pass to the state of steel, by cementation with the diamond. He therefore secured a diamond with some filings of iron, in a cavity bored in a block of soft iron, filling up the cavity with a stopper of iron. The whole properly inclosed in a crucible was exposed to the heat of a blast furnace, by which the diamond disappeared, and the metal was fused, and converted into a button of cast steel.

DIAMOND SPAR. See ADAMANTINUS.

DIANA, in mythology, the goddess of hunting. According to Cicero, there were three of this name: a daughter of Jupiter and Proserpine, who became mother of Cupid; a daughter of Jupiter and Latona; and a daughter of Upis and Glauce. The second is the most celebrated, and to her all the ancients allude. She was born, at the same birth as Apollo, in the island of Delos; and the pains which she saw her mother suffer during her labour gave her such an aversion to marriage, that she obtained leave of her father to live in perpetual celibacy, and to preside over the travails of women. To shun the society of men, she devoted herself to hunting, and was always accompanied by a number of chosen virgins, who, like herself, abjured marriage. She is represented with a quiver, and attended with dogs, and sometimes drawn in a chariot by two white stags. She was called Lucina, Ilythia, or Juno Pronuba, when invoked by women in childbed, and Trivia when worshipped in the crossways where her statues were generally erected. She was supposed to be the same as the moon, or Phœbe, and Proserpine or Hecate; and from that circumstance she was called Triformis; and some of her statues represented her with three heads, that of a horse, a dog, and a boar. She was also called Agrotera, Orthia, Taurica, Delia, Cynthia, Aricia, &c. She was supposed to be the same as the Isis of the Egyptians, whose worship was introduced into Greece with that of Osiris, under the name of Apollo. The most famous of her temples was that of Ephesus, which was one of the seven wonders of the world. (See EPHESUS.) Though she was the patroness of chastity, yet she forgot her dignity to enjoy the company of Endymion; and the very familiar favours which she granted to Pan and Orion are well known. (See ENDYMION, PAN, ORION.) The Athenians generally offered her goats, and others a white kid, and sometimes a boar pig, or an ox.

Among plants, the poppy and the ditany were sacred to her.

This goddess had also a temple at Rome upon mount Aventine, in the reign of Servius Tullius, which was built by the Romans and Latins, at both their charges; and there they met every year to offer a sacrifice, in commemoration of the league made between both nations. This temple was adorned with cows-horns. Plutarch and Livy tell us the reason of it, when they relate that Autro Coratius, a Sabine, who had a very fine cow, was advised by a soothsayer to offer it in a sacrifice to Diana of mount Aventine; promising him if he offered that sacrifice that he should never want any thing, and that the city whereof he should be a citizen should subdue all other towns of Italy. To that purpose Autro came to Rome; but a slave of king Servius having acquainted his master with Autro's design, who being gone to purify himself in the Tiber, before he offered his sacrifice, Servius made use of that opportunity, sacrificed the cow to Diana, and hung the horns in her temple.

Strabo, l. 14. de descriptione Mundi relates, that in the isle of Icarus there was a temple of Diana, called ταυροπολον or Taurica; Livy, l. 4. Dec. 4. calls it Tauropolum, and the sacrifices that were offered in that temple Tauropolia. However Dionysius in his book De situ Orbis says, that Diana was not called Tauropola from the people, but from the bulls that abound in that country.

DIANELLA, in botany. See DRACÆNA.

DIANDRIA. (δις, and ανηρ, a husband.) The second class of Linnéus's Artificial System, comprehending all hermaphrodite flowers, which have two stamens. Also the name of an order, in the classes gynandria, monœcia, diœcia. Haller calls such plants distemones.

DIANTHERA, in botany. See JUSTICIA.

DIANTHUS. Pink. In botany, a genus of the class decandria, order digynia. Calyx cylindrical, one leafed, with scales at the base; petals five with claws; capsule cylindrical, superior, one-celled. Thirty-two species; chiefly European plants, and five or six indigenous to our own country. They may be subtribuated as follows:

A. with aggregate flowers.

B. with solitary flowers, several on the same stem.

C. with a one flowered herbaceous stem.

D. with shrubby stem.

The following are those chiefly cultivated for ornament.

1. D. barbatus. Sweet-William: with flowers in clustered heads; scales of the calyx ovate-subulate, as long as the tube; leaves lanceolate. A native of Germany The mode of cultivation is too well known to need enlarging upon.

2. D. caryophyllus. Clove-gilly-flower: found wild on old walls in our own country, with solitary flowers; scales of the calyx ovate, acute, very short; petals crenate, beardless.

There are two other varieties, one with its calyx-scales imbricate: the other with flowers double and variegated. This last is the real carnation, assuming in the different individuals an infinite and most playful diversity of hues and stains.

3. D. deltoides. Common pink; with flowers solitary; scales of the calyx ovate, lanceolate, acute, generally only two; leaves rather obtuse, somewhat pubescent; petals crenate. It is found wild in our own pastures, where there is also another variety to be met with, with four scales and white petals.

4. D. Chinensis. Chinese or Indian pink: with solitary flowers; scales of the calyx tubulate, spreading, foliaceous, as long as the tube; petals crenate; leaves lanceolate. A native of China. It rises about fifteen inches high, and, among us, flowers from July to November.

DI'APASE. *s.* (δια πασων.) A chord including all tones: the old word for *diapason* (*Spenser*).

DIAPASON, from δια, by, and πας, all, in music, a musical interval, otherwise called octave: so called, because it contains all the possible diversities of sound.

The diapason is the first and most perfect of the concords: if considered simply, it is but one harmonical interval; though if considered diatonically, by tones, and semi-tones, it contains seven degrees, viz. three greater tones, two lesser tones, and two greater semi-tones.

The interval of a diapason, that is, the proportion of its grave sound to its acute, is as 2 to 1.

The ancients had seven variations, or species of the diapason, arising from the various positions of the tones and semi-tones in the scale.

DIAPASON, is also an appellation given to certain stops in an organ. See STOPS.

DIAPASON, among musical instrument-makers, is a kind of rule, by which they determine the measure of the pipes or other parts of their instruments. A square being divided into eight equal parallelograms; the points wherein a diagonal intersects all these parallelograms, express all the usual intervals in music: and on this principle it is that the diapason is founded. Thus, there is a diapason for trumpets and serpents: bell-founders have likewise a diapason, for the regulation of the size, thickness, &c. of their bells.

DIAPASON, is also compounded with other words; as *diapason diaex*, of which there are two kinds, the greater expressed by the ratio of 10 ÷ 3, the less by 16 : 5. *Diapason diapente*, a twelfth; the ratio is 9 : 3. *Diapason diatessaron*, an eleventh, founded on the ratio of 8 : 3. *Diapason ditone*, a tenth, a concord whose terms are 10 : 4. *Diapason semiditone*, a minor or imperfect tenth, the ratio of which is 12 : 5.

DIAPENSIA. In botany, a genus of the class pentandria, order monogynia. Corol salver-shaped; calyx five-leaved, imbricate, with three additional leaflets; stamens placed on the tube of the coral; capsule three-celled. One species; a native of Lapland, with linear leaves, imbricate at the base; peduncles one-flowered from the top of the branch; petals white.

DIAPENTE, in ancient music, an interval which we now call a perfect fifth.

DI'APER. *s.* (*diapre*, French.) 1. Linen cloth woven in flowers, and other figures (*Spenser*). 2. A napkin; a towel (*Shak.*).

To DI'APER. *v. a.* (from the noun.) 1. To variegate; to diversify (*Howel*). 2. To draw flowers upon clothes (*Peacham*).

DIAPERIS. In entomology, a tribe of the genus chrysomela; thus named by Fabricius in his system. See CHRYSOMELA.

DIAPHANE'ITY. *s.* (from διαφανεια.) Transparency; pellucidness (*Ray*).

DIAPHA'NIC. *a.* (δια and φαινος.) Transparent; pellucid (*Raleigh*).

DIA'PHANOUS. *a.* (δια and φαινω.) Transparent; clear; translucent (*Raleigh*).

DIAPHONICS, from δια, through, and φωνη, sound, is sometimes used for the science of refracted sound, as it passes through different mediums.

DIAPHORESIS. (*diaphoresis*, διαφορησις; from διαφορεω, to carry through.) Perspiration or increased cutaneous secretion.

DIAPHORE'TIC. *a.* (διαφορητικος.) Sudorific; promoting perspiration (*Arbuthnot*).

DIAPHORE'TICS. (*diaphoretica, medicamenta* διαφορητικα; from διαφορεω, to carry through). Sudorifics. Medicines which, from being taken internally, increase the discharge by the skin. This class of medicines comprehends five orders: 1. Pungent diaphoretics, as the volatile salts and essential oils, which are well adapted for the aged; those in whose system there is little sensibility; those who are difficultly affected by other diaphoretics; and those whose stomachs will not bear large doses of medicines. 2. Calefacient diaphoretics, such as serpentaria, contrayerva, and guaiacum: these are given in cases where the circulation is low and languid. 3. Stimulant diaphoretics, as antimonial and mercurial preparations, which are best fitted for the vigorous and plethoric. 4. Antispasmodic diaphoretics, as opium, musk, and camphor, which are given to produce a diaphoresis, when the momentum of the blood is increased. 5. Diluent diaphoretics, as water, whey, &c. which are best calculated for that habit in which a predisposition to sweating is wanted; and in which no diaphoresis takes place, although there be evident causes to produce it.

DIAPHORICA, a term given by the Greek musicians to every dissonant interval.

DIAPHRAGM. (*diaphragma*, διαφραγμα; from δια, and φραττω, to divide.) Septum transversum. The midrif. A muscle that divides the cavity of the thorax from that of the abdomen. It is composed of two muscles; the first and superior of these arises from the sternum, and the ends of the last ribs on each side. Its fibres, from this semi-circular origination, tend towards their centre, and terminate in a tendon, or aponeurosis, which is termed the centrum tendinosum. The second and inferior muscle proceeds from the vertebræ of the loins by two productions, of which that on the right side comes from the first, second, and third vertebræ of the loins; that on the left side is somewhat shorter, and both these productions join and make the lower part of the diaphragm, which joins its tendons with the tendon of the other, so that they make but one muscular partition. It is covered by the pleura on its upper side, and by the peritonæum on the lower side. It is pierced in the middle, for the passage of the vena cava; in its lower part for the œsophagus, and the nerves which go to the upper orifice of the stomach, and betwixt the productions of the inferior muscle, passes the aorta, the thoracic dust, and the vena azygos. It receives arteries and veins called phrenic or diaphragmatic, from the cava and aorta; and sometimes on its lower part two branches from the vena adiposa, and two arteries from the lumbares. It has two nerves which come from the third vertebra of the neck, which pass through the cavity of the thorax, and are lost in its substance. In its natural situation the diaphragm is convex on the upper side towards the breast, and concave on its lower side towards the belly: therefore, when its fibres swell and contract, it must become plain on each side, and consequently the cavity of the breast is enlarged to give liberty to the lungs to receive air in inspiration; and the stomach and intestines are pressed for the distribution of their contents; hence the use of this muscle is very considerable; it is the principal agent in respiration, particularly in inspiration; for when it is in action the cavity of the thorax is enlarged, particularly at the sides, where the lungs are chiefly situated; and as the lungs must always be contiguous to the inside of the thorax and upper side of the diaphragm, the air rushes into them, in order to fill up the increased space. In expiration it is relaxed and pushed up by the pressure of the abdominal muscles upon the viscera of the abdomen; and at the same time that they press it upwards, they pull down the ribs, by which the cavity of the thorax is diminished, and the air suddenly pushed out of the lungs.

DIAPHRAGM, is also a general name given to all partitions, or separations between two parts of a thing; as the little perforated partitions in the tubes of long telescopes.

DIAPHRAGMITIS. (*diaphragmitis*, διαφραγματις; from διαφραγμα, the diaphragm). Paraphrenitis. An inflammation of the diaphragm. See PARAPHRENITIS.

DIAPORESIS, in rhetoric, is used to express the hesitation or uncertainty of the speaker; and is most naturally placed in the exordium or introduction to a discourse.

DIARBECK, or DIARBEKR, a province of Turkey, in Asia, lying between the rivers Euphrates and Tigris. It has Turcomania on the N. Persia on the E. Irac Arabi on the S. and Syria on the W. This was the ancient Mesopotamia.

DIARBEKR, the capital of the above province, is a large and ancient town. It is called by the Turks Karamed: and is seated in a delightful plain, on the banks of the Tigris, near its source. The trade of this town consists chiefly in red leather, and cotton cloth of the same colour. Here are about 20,000 Christians, to whom the Turks behave remarkably well. Lat. 37. 26 N. Lon. 39. 40 E.

DIARRHŒA. (*diarrhœa*, διαῤῥοια; from διαῤῥεω, to flow through). A purging. It is distinguished by frequent stools with the natural excrement, not contagious, and seldom attended with pyrexia. It is a genus of diseases in the class neuroses, and order spasmi of Cullen, containing the following species: 1. Diarrhœa crapulosa. The feculent diarrhœa, from crapulus, or a surfeit which overloads the stomach. 2. Diarrhœa biliosa. The bilious, from an increased secretion of bile. 3. Diarrhœa mucosa. The mucous, from a quantity of slime being voided. 4. Diarrhœa hepatirrhœa. The hepatic, in which there is a quantity of serous matter, somewhat resembling flesh, voided; the liver being primarily affected. 5. Diarrhœa lienterica. The lientery; when the food passes unchanged. 6. Diarrhœa cœliaca. The cœliac passion: the food passes off in this affection in a white liquid state like chyle. 7. Diarrhœa verminosa. Arising from worms.

DIARRHOETIC. *a.* (from *diarrhœa.*) Promoting the flux of the belly; solutive; purgative (*Arbuthnot*).

DIARTHROSIS. (*diarthrosis*, from διαρθρόω, to articulate.) A moveable connexion of bones. This genus has five species, viz. enarthrosis, arthrodia, ginglymus, trochoides, and amphyarthrosis.

DIARY. (*diarium*, Latin.) A term sometimes used for a journal, or day-book, containing an account of every day's proceeding. This may be, either by way of history of what is past, as diaries of the weather for a preceding year; or by way of anticipation, as in almanacs, such as the Ladies' Diary, the Gentleman's Diary, &c.

Diary fever, an ephemera, or fever of a day.

DIASCHISMA, in music, the difference between the comma and the enharmonic diesis: the ratio expressing it is $\frac{2048}{2025}$.

DIASCORDIUM, in pharmacy, a once celebrated composition, so called from *scordium*, which was one of its ingredients. It is now expunged from the dispensatories.

DIASTALTIC, a term applied by the ancient musicians to the major third, major sixth, and major seventh.

DIASTASIS. (*diastasis*, from διιστημι, to separate.) A separation of the ends of bones.

DIASTEM, a name the ancient musicians gave to a simple interval, in contradistinction to a compound interval, which they called a system.

DIASTOLE. (*diastole*, from δια, and στελλω, to stretch.) The dilation of the heart and arteries. See Circulation of the Blood.

Diastole, in grammar, a figure whereby a syllable naturally short is made long.

DIA'STYLE. *s.* (δια and ςυλος, a pillar.) A sort of edifice, where the pillars stand at such a distance from one another, that three diameters of their thickness are allowed for intercolumniation.

DIATESSARON, in ancient music, an interval comprehending a major tone, a minor tone, and a major semitone: the terms of its ratio are 4 : 3; and it is now called a fourth.

DIATHESIS. (*diathesis*, διαθεσις; from διατιθημι, to dispose.) In medicine, any particular state of the body: thus, in inflammatory fever there is an inflammatory diathesis, and, during putrid fever, a putrid diathesis.

DIATONIC. (from δια, and τονος, tone.) An epithet given to that of the three ancient musical genera, which allowed only three degrees, the greater and less tone, and the greater semitone. The diatonic genus has long been considered as more natural than either the chromatic or enharmonic. Aristoxenus asserts it to have been the first, and informs us, that the other two were formed from the division of its intervals.

DIATONUM INTENSUM, or Sharp diatonic; the name given by musical theorists to those famous proportions of the intervals proposed by Ptolemy, in his system of that name. A system which, long after the time of this ancient speculative musician, was received in our counterpoint, and is pronounced by Dr. Wallis, Dr. Smith, and the most learned writers on harmonics, to be the best division of the scale. The numbers by which Didymus expresses these proportions are $\frac{9}{8} \times \frac{10}{9} \times \frac{16}{15} = \frac{4}{3}$: Ptolemy expressed them in the same way, merely transposing the first two terms.

DIATRÆTA, a word used by Pliny and other ancient Romans, to express a sort of cups and vases, which were of much value, and only seen at the tables of the great. They were, at first, made of pure rock crystal.

DIAULION. (from δια, and αυλος, a flute.) A performance on the ancient stage with a flute alone.

DIAULODROMI, in antiquity, those racers who turned the meta or goal, and finished their course at the place of starting. This kind of race was called diaulos.

DIAZEUCTIC, (from διαζευγνυμι, I disjoin, or sesqui-octave tone), in the ancient Greek music, was that which disjoined two fourths, one on each side of it, and which, being joined to either, made a fifth.

DIB, in ichthyology. See Sciæna ramah.

DIBBLE, or Dibber, a simple but useful implement in gardening, used for planting out not only young plants but some kinds of grain also. Dibbling of wheat has now become very general, and is a most important improvement in agriculture. See Husbandry.

DI'BSTONE. *s.* A little stone which children throw at another stone (*Locke*).

DICA'CITY. *s.* (*dicacitas*, Lat.) Pertness; sauciness.

DICE, among gamesters, certain cubical pieces of bone or ivory, marked with dots on each of their faces, from one to six, according to the number of their sides.

Dice are said to have been invented by Palamedes at the siege of Troy, for the amusement of the officers and soldiers.

Sharpers have several ways of falsifying dice: 1. By sticking a hog's bristle in them, so as to make them run high or low as they please. 2. By drilling and loading them with quicksilver; which trick is discovered by holding them gently between two diagonal corners; when if false, the heavy side will turn always downward. 3. By filing and rounding them. But all these methods fall far short of the arts of the dice-makers, some of whom are so dextrous, that sharping gamesters will give any money for such dice.

Dice pay a large stamp-duty, and are prohibited from importation.

To Dice. *v. n.* (from the noun.) To game with dice (*Shakspeare*).

Dice-box. *s.* (*dice* and *box*.) The box from which the dice are thrown (*Addison*).

DI'CER. *s.* (from *dice*.) A player at dice; a gamester (*Shakspeare*).

DICHONDRA, in botany, a genus of the class pentandria, order digynia. Calyx five-parted; corol wheel-shaped, five-parted; inferior; capsules two, one seeded. Two species; one a native of New Grenada, the other of India.

DICHORD, in music, the name given to the two-stringed lyre, said to have been invented by the Egyptian Mercury. Apollodorus accounts for its invention in the following manner: "Mercury," says he, "walking on the banks of the river Nile, happened to strike his foot against the shell of a tortoise, the flesh of which had been dried away by the heat of the sun, and nothing left of its contents but the nerves and cartilages; he was so pleased with the sound it produced, that he thence conceived the idea of a lyre, which he afterwards constructed in the form of a tortoise, and strung it with the dried sinews of animals." (*Busby*.)

This relation of Apollodorus will serve to explain a passage in the third ode of the fourth book of Horace: namely,

> O Testudinis aureæ
> Dulcem quæ strepitum, Pieri, temperas!
> O mutis quoque piscibus
> Donaturi cycni, si libeat, sonum!

This passage has been often looked upon as an extravagant whim of the poet. But, allowing that he was acquainted with the writings of the Athenian mythologist, the thought exhibited in the above lines is as natural as it is beautiful; and the muse might give even to mute fishes (or the shells of the Testudines Aquaticæ) the melodious voice of the swan. See Lyre.

DICHOTOMOUS STEM, in botany, applied to a forked stem; whence the term might be rendered furcate or forked: but neither of these terms express the full meaning of dichotomous, excepting perhaps when applied to melissa calamintha, which seldom proceeds to a second subdivision. Continually and regularly dividing by pairs from top to bottom. As in viscum or misselto, valeriana locusta.

When applied to a peduncle, as in melissa calamintha, this term may with more propriety be rendered by forked; because it seldom proceeds to a second subdivision.

Dichotomous-corymbed. Composed of corymbs, in which the pedicles divide and subdivide in pairs. As in achyranthes corymbosa.

DICHO'TOMY. *s.* (διχοτομια.) Distribution or ideas by pairs (*Watts*).

Dichotomy. Bisection. A term used by astronomers for that phasis, or appearance of the moon, wherein she is bisected, or shews just half her disk, or circle; or when she is in the beginning of her first and last quarter.

DICK, in agriculture, a term provincially employed to signify the mound or back of a ditch.

DICKER, in old writers, ten hides of skins. Also ten pairs of gloves, ten bars of iron, &c. are sometimes denoted by the term dicker.

DICKINSON (Edmund), an English physician, born at Appleton in Berkshire, 1624, and educated at Merton college, Oxford, where he took his degrees. In 1655 he published a curious book called Delphi Phænicizantes, &c. to which were added some other tracts. His chief design in this work is to prove that the heathen mythological stories were corruptions of the scripture histories of the Old Testament. In 1684 Dr. Dickinson removed to London, and soon after was appointed physician to the king. In 1702 he published his physica Vetus et Vera, sive tractarus de Naturali veritate hexæmeri Mosaici, &c. in which it is proved that the method of the creation of the universe, according to the principles of true philosophy, is, in a concise and general way, laid down by Moses. He died in 1707, and was buried in the church of St. Martin-in-the-fields. (*Watkins*).

DICKSONIA. In botany, a genus of the class cryptogamia, order filices. Fructification, in roundish, distinct marginal dots; involucre double; one from the surface opening outwards; the other from the inflated margin of the front, often embracing the former; opening inwards. Thirteen species; all exotics.

DICOCCOUS, or Two-grained capsule. (*capsula dicocca.*) In botany, consisting of two cohering grains or cells, with one seed in each.

DICOTYLEDONOUS. In botany, applied to those plants which have seeds that split into two lobes in germinating.

DICRANUM. In botany, a genus of the class cryptogamia, order musci. Capsule ovate; oblong; fringe simple, of sixteen broadish, inflected, cloven teeth. Sixty-one species; mostly natives of our own country; which may be subarranged into

A. Plants with leaves two-rowed, and compressed.

B. Plants with leaves pointing.

The dicranium or dicranum is, in all its species, exquisitely beautiful and elegant. We have selected two of the species in the botanical plate LXX, which are as follow:

D. osmundioides. Close-leaved, fern fork-moss, with erect stem; leaves imbricate in two ranks, sheathing, elliptic; lanceolate, flattened laterally; fruit stalk terminal. A native of the Down and Wicklow mountains in Ireland; and occasionally found in Scotland and Carnarvonshire. Perennial; produces fruit in the spring.

D. fuscescens. Brown forkmoss. Stem branched; leaves subulate, carinate, curvilateral; peduncle solitary, from a small sheath: capsule obovate, curved, furrowed. First discovered by Dr. Smith in 1782, in Rivelston wood near Edinburgh.

DICROTIC. (*dicroticus, pulsus*, from δις, twice, and κρουω, to strike.) A term given to a pulse in which the artery rebounds after striking, so as to convey the sensation of a double pulsation.

DICTAMNUS. (*dictamnus*, from *Dictamnus*, a city in Crete, on whose mountains it grows.) Fraxinella; bastard or white dittany. In botany, a genus of the class decandria, order monogynia. Calyx five-leaved; petals five, spreading; filaments sprinkled with glandular dots: capsules five, united. One species only. D. albus; a native of Germany and France, with large white flowers, emitting inflammable odorous effluvia. The root of the plant was formerly in medicinal use; when fresh, it has a moderately strong, not disagreeable, smell. Formerly it was much used as a stomachic, tonic, &c. but is now fallen into disuse.

DICTAMNUS CRETICUS. Dittany of Crete. The leaves of this plant, origanum dictamnus; foliis inferioribus tomentosis, spicis nutantibus, of Linnéus, are now rarely used; they have been recommended as emmenagogue and alexipharmic. See ORIGANUM.

To DI'CTATE. *v. a.* (*dicto*, Latin.) To deliver to another with authority; to declare with confidence (*Pope*).

DI'CTATE. *s.* (*dictatum*, Latin.) Rule or maxim delivered with authority: prescription; prescript (*Prior*).

DICTA'TION. *s.* (from *dictate*.) The act or practice of dictating or prescribing.

DICTATOR, a magistrate in ancient Rome, invested with regal authority. He was chosen only when the state was in imminent danger; as from foreign enemies, inward seditions, the plague, &c. The origin of this office was somewhat uncertain even in Livy's time. The dictator remained in office for six months, after which he was again elected if the affairs of the state seemed to be desperate; but if tranquillity was re-established, he generally laid down his power before the time was expired. He knew no superior in the republic, and even the laws were subjected to him. He was called dictator, because *dictas*, named by the consul, or *quoniam dictis ejus parebat populus*, because the people implicitly obeyed his command. He was named by the consul in the night *viva voce*, and his election was confirmed by the auguries. As his power was absolute, he could proclaim war, levy forces, conduct them against an enemy, and disband them at his pleasure. He punished as he pleased, and from his decision there lay no appeal, at least till later times. This office, so respectable and illustrious in the earlier ages of the republic, became odious by the perpetual usurpations of Sylla and J. Cæsar; and after the death of the latter the Roman senate passed a decree which for ever forbade the election of another dictator in Rome.

DICTATOR, is now used to signify one invested with absolute authority; or one whose credit or authority enables him to direct the conduct of others.

DICTATO'RIAL. *a.* (from *dictator*.) Authoritative; confident; dogmatical (*Watts*).

DICTA'TORSHIP. *s.* (from *dictator*.) 1. The office of a dictator (*Wotton*). 2. Authority; insolent confidence (*Dryden*).

DICTA'TURE. *s.* (*dictatura*, Latin.) The office of a dictator; dictatorship.

DI'CTION. *s.* (*diction*, French.) Style; language; expression (*Dryden*).

DI'CTIONARY, a collection, or catalogue of all the words of a language, or art, with their significations: ranged in the order of the alphabet.

What the Latins, and we after them, call dictionary, the Greeks called lexicon.

There are two principal manners of writing: in the one, which we may call scientific, we proceed from ideas, and things, to words; that is, we first lay down the thing, then the name it is called by. This is the way of discovery, or invention; because the thing ought to be first found, before it is named. In this way we come from simple and common ideas, to complex ones.

The other is didactic, just the reverse of the former; in which we go from words and sounds, to ideas and things; that is, begin with the term and end with the explanation. This is the historical way, or the way of teaching and narration; of resolving the extraordinary knowledge of one person into the ordinary of another; of distributing artificial complications into their simple ideas; and thus rasing and levelling again what art had erected.

The dictionary comes under the latter kind. It supposes the advances and discoveries made, and proceeds to explain or relate them. The lexicographer, like a historian, comes after the affair; and gives a description of what passed. The several terms are so many subjects, supposed to be known to him; and which he imparts to others, by a detail of the particulars thereof. Indeed, the analogy between a dictionary and a history is closer than people may, at first thought, imagine: the dictionary relates what has passed, with regard to each of our ideas, in the coalitions or combinations that have been made of them: its business is, to deliver the progresses made in the several parts of knowledge under consideration, by an orderly retrospect, and deduction of the terms, from their present complex to their original simple state. The dictionary of an art, is the proper history of such art, the dictionary of a language, the history of that language. The one relates that such an art, or such and such parts thereof, stand so and so; are managed so and so; and the result so and so: the other, that such and such a word is used as synonymous to such and such others. The dictionary-writer is not supposed to have any hand in the thing he relates; he is no more concerned to make the improvements, or establish the significations, than is the historian to achieve the actions he relates.

The difference between what we commonly call the history of an art, and a dictionary of it, is only circumstantial; arising from the different views of the two sorts of authors: the one chiefly regards the time and order, when each step, each advance, was first made; i. e. how it stood with respect to such and such æras, or periods of time; and might more properly be called the chronology of the art: the other, regarding chiefly the object or intention of the art, relates its present constitution, and how it proceeds to attain the end proposed. You may add, that the former primarily considers what is passed, or already advanced; the other also, what is present, or remains to be done. And if you will likewise add this, that the history intermixes divers foreign and accidental circumstances with the discovery, which the dictionary abstracts and sets aside, and so reduces it nearer to science, you will have the full and adequate difference between them. Thus, the making of the first lyre (see **Dichord**) is related with some circumstances which have no place in the proper structure of the instrument, and may therefore, without impropriety, be omitted in the dictionary, which only takes in (necessarily) what belongs to the art, or artists in general, not what belongs to some one of them.

The whole, in effect, amounts to this, that the first time of doing a thing is related by the historian with the several particulars, which in any way, though occasionally only, and remotely, affected it: whereas, the lexicographer coming afterwards, keeps more closely and severely to the point, and relates nothing but what is essential; i. e. the first time the thing is considered as now arising; a new production or phenomenon, from some analogous principle; and therefore we attend to the foreign causes that brought it forth: whereas, afterwards, we consider it as arising from a pre-existent theory, or the prescription of an artist, and thus resolve the cause into the art itself.

Any other difference which may seem to be between the two, is only as to more or less particular; which, indeed, is a thing which embarrasses and amuses us on many occasions: thus, in mere civil histories, if one relate the series of a campaign, another the bombardment of a town, and a third the wounding and death of a general officer; though the latter subjects be only part of the former, yet the first will be said to have composed a piece of history, the second a piece of fortification, and the third a piece of surgery And yet there is no other difference between them, than between the geography of a country, and the topography of a village or a hillock; the history of a nation, and the life of a single person.

To say no more, the dictionary of an art stands in much the same relation to the history thereof, that the history of a people does to the lives of all the considerable and active persons composing it. Their difference is only as to the point of sight; the eye being supposed so near in the one case, as to see the parts distinctly; and in the other so far off, as to take in the whole completely: whence the one gives you all the incidents; the other only the greater. In effect, the one is all concerted to one point of view, most favourable to the whole, and the greater parts; the other to many; the eye being shifted for each part, to furnish an adequate representation of each.

Our readers will not, we trust, judge of our work, by the description we have here given of a dictionary. Let it be recollected that ours is meant to be something more; and that we have taken all the advantages the nature of the subject would afford us: we have frequently made ourselves delinquents against strict rule, for our reader's benefit. A dictionary, by our own confession, is to be a history; and yet we have not kept so close to that form as to abandon the benefit of all others. In the business of mathematics, for instance, the regular way would be to relate or enumerate the several matters belonging thereto, without investigating or demonstrating their truth: demonstrations, strictly speaking, have nothing to do in a dictionary, no more than authentic instruments, declarations, &c. in a history. To demonstrate the several properties and relations, e. gr. of lines, angles, numbers, &c. in a dictionary, were an indiscretion as great as for a historian to produce certificates and copies of parish-registers, of the births, burials, marriages, &c. of the several persons whose actions he relates. And yet, on some extraordinary occasions, we would not, even in a mere dictionary, omit to give demonstrations; where, for instance, there was any thing very interesting, novel, not easily effected, or very important: a practice like which historians themselves frequently give into; though it be a confessed irregularity, as it breaks in upon the unity of the narration. But we are far from the views of certain dictionary-writers, who seem to think it incumbent on them to demonstrate every thing that is capable of demonstration. This is directly to forget the nature of their work; and to dispense with the rules, both to their own and the reader's cost. How dear, for example, must a competent demonstration of most of Euclid's propositions be purchased in this way. The reader must be at the pains of picking it piece-meal out of twenty several parts of the book, where the alphabet has happened to cast it. And for what is all this? Why, to make the dictionary do the business of Euclid's elements; for which it is the most unfit in the world. You might with equal propriety make an ozier basket supply the office of a pleasure boat; or a sword-pummel that of a portmanteau; as Paracelsus is said to have done. Modern times and tastes, however, have required a union of the method of the dictionary-writers, with those of the historian of art, and the author of systems: this general plan carries with it many advantages, with comparatively few and small disadvantages: it has, therefore, been adopted in the present work. See **Encyclopædia** and **Pantologia.**

Dictionary of the English language. The design of every dictionary of language is to explain, in the most accurate manner, the meaning of every word; and to shew the various ways in which it can be combined with others, in as far as this tends to alter its meaning. The dictionary which does this in the most accurate manner is the most complete. Therefore the principal study of a lexicographer ought to be, to discover a method which will be best adapted for that purpose. Dr Johnson, with great labour, has collected the various meanings of every word, and quoted the authorities: but, would it not have been an improvement if he had given an accurate definition of the precise meaning of every word; pointed out the way in which it ought to be employed with the greatest propriety; shewed the various deviations from that original meaning, which custom had so far established as to render allowable; and fixed the precise limits beyond which it could not be employed without becoming a vicious expression? With this view, it would have been necessary to exhibit the nice distinctions that take place between words which are nearly synonymous. Without this, many words can only be defined in such a manner as that they must be considered exactly synonymous. We might point out these defects in many instances; but shall content ourselves with giving the following example, to show how a dictionary of the English language might be more advantageously compiled.

Form. *subst.* The external appearance of any object, when considered only with respect to shape or figure. This term therefore, in the literal sense, can only be applied to the objects of the sight and touch; and is nearly synonymous with figure: but they differ in some respects. Form may be employed to denote more rude and unfinished shapes; figure, those which are more perfect and regular. Form can never be employed without denoting matter; whereas figure may be employed in the abstract: thus we say, a square or a triangular figure; but not a square or triangular form. And in the same manner we say, the figure of a house; but we must denote the substance which forms that figure, if we use the word form; as, a cloud of the form of a house, &c. See **Figure.**

2. In contrast to irregularity or confusion. As beauty cannot exist without form, it is by a figure of speech employed to denote beauty, order, &c.

3. As form respects only the external appearance of bodies, without regard to their internal qualities, it is, by a figure of speech, employed in contrast to these qualities, to denote empty show, without essential qualities. In this sense it is often taken when applied to religious ceremonies, &c.

4. As form is employed to denote the external appearance of bodies; so, in a figurative sense, it is applied to reasoning, denoting the particular mode or manner in which this is conducted; as, the form of a syllogism, &c.

5. In the same manner it is employed to denote the particular mode of procedure established in courts of law; as, the forms of law, religion, &c.

6. Form is sometimes, although improperly, used to denote the different circumstances of the same body; as, water in a fluid or a solid form. But as this phrase regards the internal qualities rather than the external figure, it is improper; and ought to be, water in a fluid or solid state.

7. But when bodies of different kinds are compared with one another, this term may be employed to denote other circumstances than shape or figure: for we may say, a juice exsuding from a tree in the form of wax or rosin; although, in this case, the consistence, colour, &c. and not the external arrangement of parts, constitute the resemblance.

8. From the regular appearance of a number of persons arranged in one long seat, such persons so arranged are sometimes called a form; as a form of students, &c. And,

9. By an easy transition, the seat itself has also acquired the name of form.

This may perhaps serve to give some idea of the plan of an English Dictionary composed upon philosophical principles: but, besides the circumstances we have enumerated, there are many others which would require particular attention in the execution of a work of this kind. In the English language, a great variety of terms occur, which denote matter under certain general forms or circumstances, without regarding the minute diversities that may take place; as the word cloth, which denotes matter as manufactured into a particular form, including under it all the variety of stuffs manufactured in that particular way, of whatever materials, colours, texture, or fineness they may be. The same may be said of wood, iron, yarn, and a great variety of terms of the same nature, some of which cannot assume any plural; while others admit of it in all cases, and others admit or refuse it according to the different circumstances in which they are considered. In a dictionary, therefore, all this variety of cases ought to be clearly and distinctly pointed out under each particular article: this is the more necessary, as some of these words have others formed from them, which might be readily mistaken for their plurals, although they have a very different signification; as, clothes, which does not denote any number of pieces or different kinds of cloth, but wearing apparel. The following example will illustrate this head.

Wood. *subst.* A solid substance, of which the trunks and branches of trees consist.

1. This term is employed to denote the solid parts of vegetables of all kinds, in whatever

form or circumstances they are found. Nor does this term admit of a plural with propriety, unless in the circumstances after-mentioned: for we say, many different kinds of wood, in preference to many kinds of woods; or, we say, oak, ash, or elm wood, not woods.

2. But where we want to contrast wood of one quality or country with that of another, it admits of a plural: for we say, white woods are in general softer than red; or West Indian woods are in general of greater specific gravity than the European woods: but unless where the colour, or some quality which distinguishes it from growing wood, is mentioned, this plural ought as much as possible to be avoided, as it always suggests an idea of growing wood.

3. Wood likewise denotes a number of trees growing near one another; being nearly synonymous with forest. (See FOREST). In this sense it always admits of a plural; as, "Ye woods and wilds whose solitary gloom," &c.

Farther, it is evident that a dictionary cannot be reckoned complete without explaining obsolete words; and if the terms of the several provincial dialects were likewise given, it would be of great utility: nor would this take much time; because a number of these words need no other explanation than to mark along with them the words which had come in their place, when there happened to be one perfectly synonymous: and in those cases where the same idea could not be expressed in modern language without a periphrasis, it would be of use to explain them distinctly; so that, when a writer found himself at a loss for a term, and obliged to search for one beyond the bounds of our own language, he might take one of these, when he found that it was expressive and energetic, in preference to another drawn from a foreign language. This would at least have one good effect: it would make our language more fixed and stable, not to say more accurate and precise, than by borrowing from foreign languages.

DICTUM, is used for an arbitrament or award.

DICTYS CRETENSIS, an ancient historian, who served under Idomeneus, king of Crete, at the siege of Troy; of which expedition he wrote an account. This work is said to have been the foundation of Homer's Iliad. The book which is extant under his name is generally admitted to be a forgery of the fifteenth century.

DID of *do*. (dyd, Saxon.) 1. The preterit of *do*. 2. The sign of the preter-imperfect tense. 3. It is sometimes used emphatically; as, I *did* really love him.

DIDACTIC, in the schools, signifies the manner of speaking, or writing, adapted to teach or explain the nature of things. The word is formed from the Greek διδασκω, *doceo*, I teach.

There are many words that are only used in the didactic and dogmatic way; and there are many works, ancient and modern, both in prose and verse, written after this method: such are the Georgics of Virgil, Lucretius's poem De Rerum Natura, Pope's Essays on Criticism and on Man, Akenside's Pleasures of the Imagination, &c.

DIDAPPER, in ornithology, the little grebe, or colymbus minor.

DIDASCA'LIC. *a.* (διδασκαλικος.) Preceptive; didactic (*Prior*).

To DI'DDER. *v. a.* (*diddern*, Teut.) To quake with cold; to shiver (*Skinner*).

DIDE'LPHIS. Opossum. In zoology, a genus of the class mammalia, order feræ. Fore-teeth minute, rounded; upper, ten; intermediate two longer; lower eight, intermediate two broader, very short: tusks long; grinders crenate: tongue fringed with papillæ; a pouch (in many) abdominal, covering the teats. This tribe is chiefly found in America; living in holes in woody places, burrowing in the earth, and climbing trees by means of their prehensile tail; they move slowly, and feed on birds, especially poultry, insects, worms, and vegetables. Feet usually five-toed, divided; the great toe remote: penis mostly concealed, glans divided. Females have one, two, or three abdominal pouches, which can be opened or shut at pleasure; in which the young are hid in time of danger, and which are sometimes found in the males. Nineteen species; omitting the two species of kanguroo, which are united under the same genus in the Linnéan system of Gmellin, but are separated and formed into a distinct genus by Dr. Shaw, who denominates the kanguroo genus macropus: and the two species into which he has divided it, m. major, and m. minor or kanguroo, and kanguroo-rat.

The following are the species chiefly entitled to notice:

1. D. opossum. Virginian opossum. Two varieties.

α. Tail hairy near the base; region of the eye-brows paler: head acute; ears longish oval.

β. Back dark-brown, belly yellowish: ears short, round. Both have from five to seven teats. General size rather smaller than a common cat: general measure from sixteen to twenty inches from the tip of the nose to the tail: which in the first variety is longer than the body, in the second shorter; has a disagreeable smell; and a grunting squeak in its voice.

The generation of this species of didelphis, and of those species in general which are possessed of pouches or marsupia, has, till very lately, remained a matter of great doubt, and even to the present moment is not cleared up satisfactorily. From observations made on the d. gigantea, macropus major, or kanguroo, in our own country, it has been long ascertained that the young fetus (for it can be hardly called otherwise) receives its birth, and is admitted in a very diminutive and unformed state, into the pouch of the mother, and adheres to the teat appropriated to it with peculiar and almost intractable resistance. All that we are acquainted with beyond this has been privately noticed by professor Barton of Philadelphia, and will soon be, but never has been yet, communicated to the public, in a series of memoirs upon this interesting subject. He divides the gestation of d. Virginia, which he calls d. woopink, into uterine and marsupial; the first occupies a period of from twenty-two to twenty-six days: the animal is then discharged from the uterus, and weighs not more than a single grain in common; by some means we are not yet acquainted with, it is almost immediately introduced into the marsupium, and adheres to its appropriate teat: here it continues about fifty days before it becomes of the size of a house mouse, and is able to quit occasionally its new domicilium, acquiring upon the average about nine grains a day: and while the marsupial gestation is advancing, a second uterine gestation is proceeding at the same time.

2. D. philander. Brazil opossum. Tail bushy at the base; ears pendulous; teats four: whiskers six rows; margin of the orbits dusky; feet whitish; naked part of the tail whitish with brown spots. Inhabits South America; length nine inches; of the tail fourteen.

3. D. marsupialis. Amboyna opossum. Teats eight, within the pouch. Tail length of the body. Inhabits Amboyna: size of a cat: its flesh is said to be pleasant.

4. D. marina. Marmose. Tail hairy at the base; a fold including the teats, which are from ten to fourteen; claws acute; teeth fourteen, cylindrical. Inhabits South America; eats fruits, grain, roots, and fishes: slow and stupid: six inches long; tail same length. Pouchless.

5. D. cayopollin, Mexican opossum. This is another of the few pouchless species of this genus. Tail larger than the body; margin of the orbits black: length of the body six inches; of the tail generally eleven, whitish spotted with chesnut, hairy at the base: grinders upper, five on each side. Inhabits the mountains of New Spain; lives in trees, in which it brings forth its young, who cling close to the dam when alarmed.

6. D. dorsigera. Merian opossum. So named from madame Merian, who has introduced a figure of it into her splendid work on the insects of Surinam. Tail hairy at the base; longer than the body, whitish; of the male spotted, brownish, naked; ears naked, sharp; claws of the fore feet obtuse, of the hind feet sharp. Inhabits Surinam; burrows in the ground; is without pouch, but has five or six teats; brings five or six young, which when in danger adhere to the back of the mother, by twisting their tails round her: size of a rat. See Nat. Hist. Plate XLV.

7. D. cancrivora. Cayenne opossum. Tail scaly, almost naked, nearly as long as the body: thumb of the hind feet flat: hair curled like wool. Inhabits marshy places in Cayenne; feeds on crabs, which it hooks out from their holes with its prensile tail; grunts like a pig; grows flat; easily tamed; brings forth from four to five in hollow trees; flesh good, resembling that of a hare.

8. D. orientalis. Phalanger. Tail hairy from the base to the middle, prensile, longer than the body: two middle toes of the hind feet united. Inhabits the Molucca islands; supposed also to inhabit Australasia; is timid, and resembles the squirrel in voice and manner of eating; teats from two to four; as many young.

9. D. volans. Pentaurus, or flying opossum. A broad, hairy membrane, extending from the middle of the fore-legs to the first joint of the hind-legs, not including the tail. Inhabits Australasia; body twenty inches long: tail twenty-two: its general appearance is that of a flying squirrel; and its size, colours, and form, conspire to render it one of the most beautiful of quadrupeds.

10. D. sciurea. Squirrel opossum. A lateral flying membrane; body grey above; snowy beneath; tail prehensile, very hairy, black towards the tip. Size of a squirrel; eyes black and full; pouch large; a black stripe down the head and back. Inhabits Australasia; is torpid by day, but extremely active by night: a very elegant quadruped.

DIDELTA, in botany, a genus of the class syngenesia, order polygamia frustranea. Receptacle bristly; seeds crowned with many-leaved chaff; calyx double; the outer about three-leaved, inner many-leaved. Two species: both natives of the Cape, and annual plants.

DIDEROT (Dionysius), a French writer, born at Langres in 1713. He settled early at Paris, where he soon procured friends by his wit and talents. In 1740, he published Pensées Philosophiques, which was afterwards reprinted under the title of Etrennes aux Esprits forts. In 1746, he was concerned in a Medical Dictionary, which suggested to him the idea of a Dictionnaire Encyclopédique; which, with the assistance of powerful associates, he at length completed. His share in this great work was very large, and the whole of the articles on arts and trade were furnished by him. While he was engaged in the Encyclopédie, he wrote some other works; as a licentious novel, called Bijoux Indiscrets, and two comedies, the Fils Natural, and the Père de Famille. In 1749, appeared his Letters to the Blind, the free sentiments in which occasioned his being imprisoned for six months at Vincennes. On recovering his liberty he wrote a Letter on the Deaf and Dumb, in which he throws out a variety of reflections on miscellaneous subjects. His other works are: 1. Principles of Moral Philosophy. 2. Reflections on the Interpretation of Nature. 3. The Code of Nature. 4. The sixth Sense. 5. Of Public Education. 6. Panegyric on Richardson. 7. Life of Seneca. In the major part of the works of Diderot he kept one great object in view, which was the propagation of deistical principles and sophisms Indeed he was during most of his life a decided atheist, and he was pretty active in disseminating his notions: he was assisted by D'Alembert and others, who when the intention of Diderot was too plain and open, threw a mist over it, that the design might not be so palpable as to defeat itself.

Notwithstanding his numerous publications, Diderot was never rich. Soon after the publication of the last volumes of the Encyclopedie, upon which he had been employed for upwards of twenty years, his circumstances were so straitened, that an expedient was to be devised for their improvement. He had long corresponded with the late empress of Russia, whom he persuaded to consider him as the greatest, or one of the greatest economists of France. In the course of the correspondence he had mentioned his own library as one of the most valuable in Europe; and when Catharine wanted to purchase it and make him librarian, he said that his constitution could not support the cold climate of St. Petersburgh. She offered to let him keep it during his lifetime in Paris; and the library was sold for an immense price. When her ambassador wanted to see it, after a year or two's payments, and the visitation could be no longer put off, Diderot was obliged to run in a hurry through all the booksellers shops in Germany to fill his empty shelves with old volumes. He had the good fortune to save appearances; but the trick took air, because he had been niggardly in his attention to the ambassador's secretary. This, however, did not hinder him from visiting his imperial pupil, to whom he told a poor story, in hopes of getting his daughter married with parade, and patronised by her majesty; but the scheme was seen through, and he was disappointed.

In the year 1784, Diderot's health began visibly to decline; and one of his domestics, perceiving that his death was at no great distance, acquainted him with his apprehensions, and addressed him on the importance of preparing for another world. He heard the man with attention, thanked him kindly, acknowledged that his situation required seriousness, and promised to weigh well what he had said. Some time after this conversation he desired that a priest might be brought; and the same domestic introduced to him M. de Farsac, Curé de St. Sulpice. Diderot saw this ecclesiastic several times, and was preparing to make a public recantation of his errors. Condorcet and the other adepts now crowded about him, persuaded him that he was cheated, that his case was not so dangerous as it was said to be, and that he only wanted the country air to restore him to health. For some time he resisted their attempts to bring him back to atheism, but was at last prevailed upon to try the effect of the country air. His departure was kept secret, and he was concealed in the country till the 2d of July, when he died. His dead body was secretly brought back to Paris, and a report was spread and believed that he died suddenly on rising from the table, without remorse, and with his atheism unshaken.

As to the character of Diderot, it has been variously given by different writers. It should seem, however, that he had a considerable knowledge of mathematics, metaphysics, and the belles lettres. He has been extolled for frankness; but unless his frank avowal of atheism, we see not what claim he has to the character. M. Bauze coming one day into Diderot's house, found him explaining to his daughter a chapter of the Gospel history. When he expressed some surprise at this conduct, Diderot said, "J'entends ce que vous voulez dire; mais au fond, quelles meilleures leçons pourrois je lui donner ou trouverai je mieux?" It was a common assertion of Diderot's, that between him and his dog "il n'y avoit de difference que habit." In uttering this sentiment, he did not resemble Pope's Indian with untutored mind,

> "Who thinks, admitted to that equal sky,
> His faithful dog shall bear him company."

The Indian hopes to carry his dog with him to heaven; but Diderot hoped to die like a dog, and to be as if he had not been.

DIDO, called also Elisa, in dubious history, a daughter of Belus, king of Tyre, who married Sichæus, or Sicharbas, her uncle, who was priest of Hercules. Pygmalion, who succeeded to the throne of Tyre, after Belus, murdered Sichæus, to get possession of the immense riches which he had; and Dido, disconsolate for the loss of her husband, set sail in quest of a settlement, with a number of Tyrians, to whom the cruelty of the tyrant became odious. During her voyage, she visited the coast of Cyprus. Afterwards a storm drove her fleet on the African coast, and she bought of the inhabitants as much land as could be covered by a bull's hide, cut into thongs. Upon this piece of land she built a citadel, called Byrsa (see BYRSA), and the increase of population, and the rising commerce among her subjects, soon obliged her to enlarge her city, and the boundaries of her dominions. Her beauty, as well as the fame of her enterprise, gained her many admirers; and her subjects wished to compel her to marry Iarbas, king of Mauritania, who threatened them with a dreadful war. Dido begged three months to give her decisive answer; and during that time, she erected a funeral pile, as if wishing, by a solemn sacrifice, to appease the manes of Sichæus, to which she had promised eternal fidelity. When all was prepared, she stabbed herself on the pile in presence of her people, and by this uncommon action obtained the name of Dido, valiant woman, instead of Elisa. According to Virgil and Ovid, the death of Dido was caused by the sudden departure of Æneas, of whom she was deeply enamoured, and whom she could not obtain as a husband. This poetical fiction represents Æneas as living in the age of Dido, and introduces an anachronism of near 300 years. Dido left Phœnicia 247 years after the Trojan war, or the age of Æneas, that is, about 953 years B.C. (*Justin. Virg*, &c.)

DIDST. The second person of the preter tense of *do*. I *did*, thou *didst*.

DIDU'CTION. *s.* (*diductio*, Lat.) Separation by withdrawing one part from the other (*Boyle*).

DIDUS. Dodo. In zoology, a genus of the class aves, order gallinæ. Bill narrowed in the middle, with two transverse wrinkles; each mandible bent in at the tip; nostrils oblique, near the edge of the middle of the bill; face naked beyond the eyes; legs short, thick; feet cleft; wings unfit for flight; tailless. Three species. See Nat. Hist. Plate II.

1. D. ineptus. Dronte, or hooded dodo. Black, waved whitish; head hooded; feet four-toed. Bill strong, large, blueish, with a red spot; the upper mandible reddish at the tip, the lower bulging near the tip; gape very large; irids whitish, head large, black, as covered with a cap; feathers of the rump curled; inclining to yellow; clawless. Inhabits the isles of France and Bourbon. Three feet long.

2. D. solitarius. Solitary dodo. Varied with grey and brown; feet four-toed; eyes black; spurious wings terminating in a round protuberance. Female with a white protuberance each side the breast, resembling a teat. Inhabits the island Rodrigue. Size of a turkey; never in flocks; whence its specific name; rarely more than a pair being ever found together. Makes its nest in retired places of palm-leaves; and lays one egg rather larger than that of a goose. The sitting extends to seven weeks, and the male takes his turn with the female. The young are stupid, and will not readily fly at the approach of strangers; they are chased between March and September; the young affording delicious food.

3. D. nazarenus. Nazarene dodo. Black; downy; feet three-toed. Bill large; feathers of the rump erect, curled, on the body downy: legs long, scaly. Inhabits the isle of France; larger than a swan; builds on the ground with leaves and dry grass, and lays one large egg.

DI'DYMI. (*didymi*, from διδυμος, double.) Twins. An old name of the testicles, and two eminences of the brain, from their double protuberance.

DI'DYMOUS. (διδυμος, twin.) In botany; anther, capsule, berry. Duobus nodis extus protuberantes. See TWIN.

DIDYMUS, of Alexandria, an ecclesiastical writer of the 4th century. Though he became blind at the age of five years, yet he made so great a progress in his studies, as to have acquired a most extensive knowledge of the sciences and the scripture. His reputation was so high that he was appointed divinity professor, and had St. Jerom and other great men for his disciples. Nothing of his remains but a Latin translation of his Treatise on the Holy Spirit, some remarks on the Canonical Epistles, and a book against the Manichees. He died in 395, aged 85.

DIDYNA'MIA. (δις, twice, and δυναμις, power.) The name of the fourteenth class in Linnéus's Artificial System, comprehending those plants which have hermaphrodite flowers, with four stamens in two pairs of different lengths; the outer pair longer, the middle pair shorter and converging. The flowers have one pistil; and the corol is irregular; either ringent or personate.

It is a natural class, containing the labiati and personati of Tournefort, and the monopetali irregulares of Rivinus.

Linnéus has divided it into two orders: 1. Gymnospermia, or such as have naked seeds. 2. Angiospermia; such as have the seeds enclosed in a vessel.

To DIE. *v. a.* (ꝺeaᵹ, Saxon, a colour.) To tinge; to colour; to stain (*Milton*).

DIE. *s.* (from the verb.) Colour; tincture; stain; hue acquired. See DYE and DYING.

To DIE. *v. n.* (ꝺeaꝺian, Saxon.) 1. To lose life; to expire; to pass into another state of existence (*Sidney*). 2. To perish by violence or disease (*Dryden*). 3. To be punished with death (*Hammond*). 4. To be lost; to perish (*Spectator*). 5. To sink; to faint (*Samuel*). 6. (In theology.) To perish everlastingly (*Hakewill*). 7. To languish with pleasure (*Pope*). 8. To vanish (*Addison*). 9. To languish with affection (*Tatler*). 10. To wither, as a vegetable (*John*). 11. To grow vapid, as liquor.

DIE. *s. pl. dice,* (*dé,* Fr. *dis,* Welsh.) 1. A small cube, marked on its faces with numbers from one to six, which gamesters throw in play (*South*). 2. Hazard; chance (*Spenser*). 3. Any cubick body.

DIE. *s. pl. dies.* The stamp used in coinage (*Swift*).

DIEMEN'S LAND, the southern coast or point of New Holland Lat. 43. 21. 20 S. Lon. 147. 29 E. This coast was discovered in November 1642, by Tasman, who gave it the name of Van Diemen's Land. Captain Furneaux touched at it in March 1773, and the country has been since further explored by our late navigators. Here is a very safe road, named by captain Cook Adventure Bay. The parts adjoining to the bay are mostly hilly, and form an entire forest of tall trees, rendered almost impassable by brakes of fern, shrubs, &c. The soil on the flat land, and on the lower part of the hills, is sandy, or consists of a yellowish earth, and in some parts of a reddish clay; but further up the hills it is of a tough grey sort.

DIEMERES, in the ancient music, a word used sometimes alone, and sometimes joined with the word phorbeia. It expressed a sort of bandage, used by the ancients, to tie up the lower lip in playing on the pipe.

DIEPPE, a town of France, in the department of Lower Seine, and late province of Normandy. It has a good harbour. Packet-boats pass from this port to Brighton in times of peace. Lat. 49. 55 N. Lon. 1. 9 E.

DIER, or DYER, one that follows the trade of dying; one that dies clothes.

DIE'RVILLA. (*diervilla*, named in honour of Mr. Dierville, who first brought it from Arcadia.) The young branches of this species of honeysuckle, lonicera diervilla; racemis terminalibus, foliis serratis, of Linnéus, are employed in North America as a certain remedy in gonorrhœa and suppression of urine. It has not yet been exhibited in Europe.

DIES. See DAY.

DIES MARCHIÆ, was the day of congress or meeting of the English and Scots, annually appointed to be held on the marches or borders, in order to adjust all differences between them.

DIESIS, in music, is the division of a tone *less than a semitone; or an interval consisting of a less or imperfect semitone. Diesis is the smallest and softest change or inflexion of the voice imaginable:* it is called a faint, expressed thus X, by a St. Andrew's cross or saltier. Diesis, in modern music, is the name given to the elevation of a note above its natural pitch. This raising of the sound is, however, only a kind of insensible gliding through the interval of a semi-tone, and does not produce any change in the denomination of the note upon which it operates. With some authors, diesis is only another name for the quarter of a tone.

DIESPITER, in antiquity, a name given to Jupiter.

DIESSENHOFFEN, a considerable town of Swisserland, in Thurgau, seated on the Rhine. Lat. 47. 35 N. Lon. 8. 42 E.

DIET. (*diæta*, διαιτα.) The dietetic part of medicine is no inconsiderable branch, and seems to require a much greater share of regard than it commonly meets with. A great variety of diseases might be removed by the observance of a proper diet and regimen, without the assistance of medicine, were it not for the impatience of the sufferers. However, it may on all occasions come in as a proper assistant to the cure, which sometimes cannot be performed without a due observance of the non-naturals. Yet in various instances it must be confest, that many physicians appear to be too strict and particular in the rules of diet and regimen, which they deliver as proper to be regarded by all who are solicitous either to preserve or recover their health. The too anxious attention to these rules hath often hurt those who are well, and added unnecessarily to the distresses of the sick. The common experience of mankind will sufficiently acquaint any one with the sorts of food which are wholesome to the generality of men; and his own experience will teach him which of these agrees best with his particular constitution. Scarcely any other directions beside these are wanted, except that, as variety of food at the same meal, and poignant sauces, will tempt most persons to eat more than they can well digest, they ought, therefore, to be avoided by all who are afflicted with any chronical disorder, or wish to keep free from them. Small beer, where it agrees, or water alone, are the properest liquors at meals. Wine or spirits mixed with water have gradually led on several to be sots, and have ruined more constitutions than ever were hurt by small beer from its first invention.

In fevers a little more restraint is necessary, but not so much as is often enjoined. The stronger sorts of meat and fish are most usually loathed by the sick themselves, nor could they be eaten without offending the stomach, and increasing the distemper, while it is at all considerable; but in its decline, the sick are often desirous of some of the milder sorts of meat, and no harm follows from indulging their desire. The English nation are said to eat more meat when they are well than most others; but were remarkable, so long ago as the time of Erasmus, for avoiding it more scrupulously when they are sick than any other people. How high soever the fever be, the sick may safely be nourished with weak broths and gellies, and with any vegetable substances, if we except the acrid and aromatic, or with the infusions or decoctions prepared from them; and we know no reason for preferring any of these to the rest. Eggs and milk have been, we know not by what authority, forbidden in all fevers; but, as far as our experience goes, they both afford innocent food in the worst, where they are grateful to the patients.

The feverish thirst is best allayed by pure water, which may be drunk either warm, or cold, at the option of the sick person, and he may drink as much as he pleases; but we see no advantage in persuading him to gorge himself with liquids, as is often done, against his inclination and stomach. If water be deemed too insipid, currant gelly, and a variety of syrups, may be dissolved in it; or apples sliced or roasted, tamarinds, sage, or balm, or toasted bread, may be infused in it; or decoctions may be made of oatmeal, barley, or rice; or the water may be made into an emulsion with the oily seeds; all which, with a variety of similar substances, merely correct its insipidness, but in other respects leave it just what it was.

There is scarcely any distemper, in every stage of which it may not be safely left to the patient's own choice, if he be perfectly in his senses, whether he will sit up or keep his bed. His strength and his ease are chiefly to be attended to in settling this point; and who can tell so well as himself, what his case requires, and what his strength will bear?

Doubts are often raised about the propriety of changing the linen in sickness, just as there have been about changing the foul air of the sick chamber by any of the means which could refresh and purify it. There can be very little reason to fear any mischief from the cold which the sick may feel while their clean linen is putting on; for their attendants, with common care, will do this as safely as many other things which must necessarily be done for them. But some have a strange opinion of harm from the smell of the soap perceivable in linen after it has been washed, and therefore allow not their patients, when they change their linen, ever to put on fresh, but such only as has been worn, or lain in, by other persons. By this contrivance, indeed, the smell of the soap might be taken off, but few cleanly people would think they gained any advantage by the change. Now if a faint smell of soap were noxious, then soap-makers and laundry-servants must be remarkably unhealthy, which is contrary to experience: nor is it less so that the sick are injured by the cleanliness of what they wear: on the contrary, the removal of their foul linen generally diffuses over them a sense of ease and comfort, and occasionally lulls them into a quiet and refreshing sleep.

The dread of producing mischief by a change of linen, however, like that of producing mischief by a change of air, has of late years been yielding to the dictate of common sense: and the pleasureable and instinctive feeling which has largely concurred to obtain these advantages for the invalid, should chiefly regulate him in the choice of his regimen.

Some authors have thought it right to indulge in long disquisitions upon the subject of diet: but excepting the few general observations which we have now advanced, whatever else is necessary to be remarked, will fall with more pertinency under the articles of the different constitutions and diseases that require a particular attention to this subject.

Diet, or **Dyet**, in matters of policy, signifies the general assembly of the states or circles of an empire, to deliberate and concert measures proper to be taken for the good of the public. The general diet of the empire of Germany is usually held at Ratisbon. It consists of the emperor, the nine electors, and the ecclesiastical princes; viz. the archbishops, bishops, abbots, and abbesses; the secular princes, who are dukes, marquises, counts, viscounts, or barons; and the representatives of imperial cities. It meets on the emperor's summons, and any of the princes may send their deputies thither in their stead. The diet makes laws, raises taxes, determines differences between the several princes and states, and can relieve the subjects from the oppressions of their sovereigns.

To **Di'et.** *v. a.* (from the noun.) 1. To feed by the rules of medicine (*Shakspeare*). 2. To give food to (*Shakspeare*). 3. To board; to supply with diet.

To **Di'et.** *v. n.* 1. To eat by rules of physic. 2. To eat; to feed (*Milton*).

DI'ET-DRINK. *s.* (*diet* and *drink.*) Medicated liquors (*Locke*).

DI'ETARY. *a.* (from *diet.*) Pertaining to the rules of diet.

DI'ETER. *s.* (from *diet.*) One who prescribes rules for eating (*Shakspeare*).

DIETETICAL. Diete'tick. *a.* (διαιτητικὸν) Relating to diet; belonging to the medical cautions about the use of food (*Arbuthnot*).

DIETE'TICS, that part of medical physiology which contemplates the nature and properties of particular foods in reference to particular constitutions or temperaments, or the diversified digestive organs of particular animals. See **Diet**, **Physiology**, and **Digestion.**

DIETZ, a town of Weteravia, capital of a county of the same name, with a strong castle. Lat. 50. 12 N. Lon. 7. 35 E.

DIEU ET MON DROIT, i. e. God and my right, the motto of the royal arms of England, first assumed by king Richard I. to intimate that he did not hold his empire in vassalage of any mortal. It was afterwards taken up by Edward III. and was continued without interruption to the time of the late king William, who used the motto *Je main tiendray*, though the former was still retained upon the great seal. After him queen Anne used the motto *Semper eadem*, which had been before used by queen Elizabeth; but ever since queen Anne, *Dieu et mon droit* continues to be the royal motto.

DIFF, an Arabian musical instrument: it is a hoop over which a parchment is distended, and pieces of brass are fixed to it, to make a jingling when it is struck or rubbed. This is the tympanum of the ancients.

DIFFANEATION, among the Romans, a ceremony whereby the divorces of the priests were completed.

To **DI'FFER.** *v. n.* (*differo*, Latin.) 1. To be distinguished from; to have properties and qualities not the same with those of another (*Addison*). 2. To contend; to be at variance (*Rowe*). 3. To be of a contrary opinion (*Burnet*).

DI'FFERENCE. *s.* (*differentia*, Latin.) 1. State of being distinct from something; contrariety to identity (*Hooker*). 2. The quality by which one differs from another (*Raleigh*). 3. The disproportion between one thing and another (*Hayward*). 4. Dispute; debate; quarrel (*Tillotson*). 5. Distinction (*Addison*). 6. Point in question; ground of controversy (*Shakspeare*). 7. A logical distinction (*Bacon*). 8. Evidences of distinction; differential marks (*Davies*).

Difference, in logic, an essential attribute belonging to any species that is not found in the genus, and is the universal idea of that species: thus body and spirit are two species of substance, which contain in their ideas something more than is in that of substance. In a body, we find impenetrability and extension; in a spirit, a power of thinking and reasoning: so that the difference of body is impenetrable extension, and the difference of a spirit is cogitation.

Difference, in mathematics, is the remainder, when one number or quantity is subtracted from another.

Difference of latitude, in geography, is an arch of the meridian, included between the parallels of latitude on which any two places lie. If the latitudes be both north, or both south, the less latitude taken from the greater will leave the difference of latitude: but if the latitudes be one north, the other south, their sum will shew the difference of latitude.

Difference of longitude, in geography, is an arch of the equator included between the meridians of any two given places. If the two places lie both on the same side of the first meridian, the less longitude taken from the greater will be the difference of longitude: but, if they lie on different sides of the first meridian, their longitudes must be added for the difference of longitude sought.

To **Di'fference.** *v. a.* (from the noun.) To cause a difference; to make one thing not the same as another (*Holder*).

DI'FFERENT. *a.* (from *differ.*) 1. Distinct; not the same (*Addison*). 2. Of contrary qualities (*Philips*). 3. Unlike, dissimilar (*Locke*).

DIFFERENTIAL, Differentiale, in the higher geometry, an infinitely small quantity, or a particle of quantity so small as to be less than any assignable one. It is called a differential, or differential quantity, because frequently considered as the difference of two quantities; and, as such, is the foundation of the differential calculus. Sir Isaac Newton, and the English, call it a moment, as being considered as the momentary increase of quantity.

Differential equation, an equation involving differential quantities.

Differential calculus. See Calculus.

Differential method, in mathematics, a method of finding quantities by means of their successive differences: these differences, in the ordinates of parabolic curves, becoming ultimately equal, and the required ordinate of the curve being determinable by them, led to the adoption of the name differential method.

This method teaches, having a certain number of the ordinates of any unknown curve given, with the points of the absciss on which they stand, to find out such a general law for this curve, viz. such an equation expressing the relation of the ordinate and absciss, as will suit the ordinates and abscissæ in any points of the absciss given, in the unknown curve under consideration. If many ordinates be given; if the distances of the points of the absciss, on which they stand, be equal and small; if the ordinate required lie amongst them, or near them; and if there be reason to think that the curve itself is formed according to some simple, though unknown law; then may we conclude, that the new ordinate determined by the equation does not vary far from the truth. And, if the resulting equation be simple, and always the same, from whatever given ordinates it be extracted, there is the greatest reason to think that this is the real law or equation of the curve; and consequently that all its points and properties may be determined with perfect exactness by means of such equation: whereas, if the given ordinates be few, their distances great or unequal, the ordinate required considerably distant from many or most of them, the unknown curve a line drawn at hazard, and the resulting equation very different where different ordinates are given, though their number be the same, there will be little probability of determining the new ordinate with exactness; still, however, the differential method affords us the greatest probability which the data permit in such cases.

This method may be applied to the construction of tables, and the summation of series: also when some terms of a series are given, and conceived as placed at given intervals, any intermediate term may be found nearly. By it, likewise, may any curvilinear figure be squared nearly, having some of its ordinates given. We will illustrate the mode of operation, by a problem, as below:

A series of numbers, placed at equal intervals, being given, to find any intermediate number of that series, when its distance from the first term of the series is given. Subtract each term of the series from the next following term, and call the remainders first differences, then subtract in like manner each of these differences from the next following one, calling these remainders 2d differences; again, subtract each 2d difference from the next following, for the 3d differences; and so on: then if A be the 1st term of the series,

d' the first of the 1st differences,
d'' the first of the 2d differences,
d''' the first of the 3d differences, &c.;

and if x be the interval or distance between the first term of the series and any term sought, T, that is, let the number of terms from A to T, both included, be $= x + 1$; then will the term sought, T, be =

$$A + \frac{x}{1} d' + \frac{x}{1} . \frac{x-1}{2} d'' + \frac{x}{1} . \frac{x-1}{2} . \frac{x-2}{3} d''' \text{ \&c.}$$

Hence, if the differences of any order become equal, that is, if any of the diffs. d'', d''', &c. become = 0, the above series will give a finite expression for T the term sought; it being evident, that the series must terminate when any of the diffs. d'', d''', &c. become = 0.

It is also evident that the co-efficients $\frac{x}{1}$, $\frac{x}{1} . \frac{x-1}{2}$, &c. of the differences, are the same as the terms of the binomial theorem.

For ex. Suppose it were required to find the log. tangent of 5′ 1″ 12‴ 24⁗, or 5′ 1″ $\frac{62}{300}$, or 5′ 1″ ·2066, &c.

Take out the log. tangents to several minutes and seconds, and take their first and second differences, as below:

	Tang.	d′	d″	
5′ 0″ . .	7·1626964	14453		
5 1 . .	7·1641417	14404	—49	—48
5 2 . .	7·1655821	14357	—47	
5 3 . .	7·1670178			

Here $A = 7{\cdot}1641417$; $x = \frac{62}{300}$; $d' = 14404$; and the mean 2d difference $d'' = -48$. Hence

A . . .	7·1641417
xd' . . .	2977
$\frac{x}{1} . \frac{x-1}{1} d''$.	4
Theref. the tang. of 5′ 1″ 12‴ 24⁗ is	7·1644398

Farther information may be obtained by consulting Newton's Method. Differenti. Sterling's Method. Differen. Cotes de Method. Differ. Emerson's Differential Method, Simpson's Dissertations, and his Essays.

Differential scale, in algebra, the scale of relation subtracted from unity. See Scale.

DI'FFERENTLY. *ad.* (from *different*.) In a different manner (*Boyle*).

DIFFI'CIL. *a.* (*difficilis*, Latin.) 1. Difficult; hard; not easy (*Hudibras*). 2. Scrupulous; hard to be persuaded (*Bacon*).

DIFFI'CILNESS. *s.* (from *difficil*.) Difficulty to be persuaded; incompliance (*Bacon*).

DI'FFICULT. *a.* (*difficilis*, Latin.) 1. Hard; not easy; not facil (*Zachariah*). 2.

Troublesome; vexatious. 3. Hard to please; peevish; morose.

DI'FFICULTLY. *ad.* (from *difficult.*) Hardly; with difficulty; not easily (*Rogers*).

DI'FFICULTY. *s.* (*difficulté*, French.) 1. Hardness; contrariety to easiness (*Rogers*). 2. Something hard to accomplish (*South*). 3. Distress; opposition (*Dryden*). 4. Perplexity in affairs (*Addison*). 5. Objection; cavil (*Swift*).

To DIFFI'DE. *v. n.* (*diffido*, Latin.) To distrust; to have no confidence in (*Dryden*).

DI'FFIDENCE. *s.* (from *diffide.*) 1. Distrust; want of confidence in others (*Bacon*). 2. Doubt; want of confidence in ourselves (*Bentley*).

DI'FFIDENT. *a.* (from *diffide.*) 1. Distrustful; doubting others (*Milton*). 2. Doubtful of an event; uncertain (*Pope*). 3. Doubtful of himself; not confident (*Clarissa*).

To DIFFI'ND. *v. a.* (*diffindo*, Latin.) To cleave in two; to split.

DIFFI'SSION. *s.* (*diffissio*, Lat.) The act of cleaving or splitting.

DIFFLA'TION. *s.* (*difflare*, Lat.) The act of scattering with a blast of wind.

DI'FFLUENCE. Di'ffluency. *s.* (from *diffluo*, Latin.) The quality of falling away on all sides (*Brown*).

DI'FFLUENT. *a.* (*diffluens*, Lat.) Flowing every way; not consistent; not fixed.

DI'FFORM. *a.* (from *forma*, Lat.) Contrary to uniform; dissimilar; unlike (*Newton*).

Difform. (*difformis.*) In botany, a term applied to the flower by Jungius and Knaut. The parts of which do not correspond either in size or proportion.

Difform leaves. In botany. Diversæ figuræ in eadem planta. Of different shapes on the same plant. As in ranunculus aquatilis, rudbeckia triloba, euphorbia heterophylla, lepidium perfoliatum, hibiscus virginicus, pentacarpos, sabdariffa.

It is observable, that aquatic plants sometimes have the leaves under water finely cut, whilst those above water are not so. On the contrary, in mountain plants, the upper leaves are usually most cut.

DIFFO'RMITY. *s.* (from *difform.*) Diversity of form; irregularity; dissimilitude (*Brown*).

DIFFRACTION OF LIGHT. See Inflection.

DIFFRA'NCHISEMENT. *s.* (*franchise*, Fr.) The act of taking away privileges.

To DIFFU'SE. *v. a.* (*diffusus*, Latin.) 1. To pour out upon a plane (*Burnet*). 2. To spread; to scatter; to disperse (*Milton*).

Diffu'se. *a.* (*diffusus*, Lat.) 1. Scattered; widely spread. 2. Copious; not concise.

DIFFU'SED. *part. a* (from *diffuse.*) Wild; uncouth; irregular (*Shakspeare*).

Diffu'sed stem, in botany, having spreading branches; diffused panicle; panicle hanging loose; opposed to close or compact. When the pedicels are spread about loosely, at right or obtuse angles with the main peduncle.

DIFFU'SEDLY. *ad.* (from *diffused.*) Widely; dispersedly.

DIFFU'SEDNESS. *s.* (from *diffused.*) The state of being diffused; dispersion.

DIFFU'SELY. *ad.* (from *diffuse.*) 1. Widely; extensively. 2. Copiously; not concisely.

DIFFU'SION. *s.* (from *diffuse.*) 1. Dispersion; the state of being scattered every way (*Boyle*). 2. Copiousness; exuberance of style.

DIFFU'SIVE. *a.* (from *diffuse.*) 1. Having the quality of scattering any thing every way (*Dryden*). 2. Scattered; dispersed (*South*). 3. Extended (*Tillotson*).

DIFFU'SIVELY. *ad.* Widely; extensively; every way.

DIFFU'SIVENESS. *s.* (from *diffusive.*) 1. Extension; dispersion. 2. Want of conciseness (*Addison*).

To DIG. *v. a.* preter. *dug* or *digged*; part. pass. *dug* or *digged* (*dygor*, Danish.) 1. To pierce with a spade (*Ezekiel*). 2. To form by digging (*Whitgift*). 3. To cultivate the ground by turning it with a spade (*Temple*). 4. To pierce with a sharp point (*Dryden*). 5. To gain by digging (*Woodward*).

To Dig. *v. n.* To work with a spade (*Job*).

To Dig *up*. *v. a.* To throw up that which is covered with earth (*Shakspeare*).

DI'GAMY. *s.* (διγαμια.) A second marriage (*Bishop Ferne*).

DIGA'STRICUS. (*digastricus*, from δις, twice, and γαστηρ, a belly.) Biventer maxillæ inferioris. A muscle so called from its having two bellies, situated externally between the lower jaw and os hyoides. It arises, by a fleshy belly, from the upper part of the processus mastoidæus, and descending, contracts into a round tendon, which passes through the stylohyoidæus, and an annular ligament which is fastened to the os hyoides, then it grows fleshy again, and ascends towards the middle of the edge of the lower jaw, where it is inserted. Its use is to open the mouth by pulling the lower jaw downwards and backwards; and when the jaws are shut, to raise the larynx, and consequently the pharynx upwards, as in deglutition.

DIGBY (Sir Kenelm), became very illustrious in the seventeenth century for his virtue and learning. He was descended of an ancient family in England. His great-grandfather, accompanied by six of his brothers, fought valiantly at Bosworth-field on the side of Henry VII. against the usurper Richard III. His father, Everard, suffered himself to be engaged in the gun-powder plot against king James I. and for that crime was beheaded. His son wiped off that stain, and was restored to his estate. King Charles I. made him gentleman of the bedchamber, commissioner of the navy, and governor of the Trinity-house. He granted him letters of reprisal against the Venetians, by virtue whereof he took several prizes with a small fleet which he commanded. He fought the Venetians near the port of Scanderoon, and bravely made his way through them with his booty. He was a great lover of learning, and translated several authors into English; and his

Treatise of the Nature of Bodies and the Immortality of the Soul, discovers great penetration and extensive knowledge. He applied to chemistry; and found out several useful medicines, which he gave freely away to people of all sorts, especially to the poor. He degraded himself, however, by his sympathetic powder for the cure of wounds at a distance; his discourse concerning which made a great noise for a while. He had conferences with Des Cartes about the nature of the soul. In the beginning of the civil wars, he exerted himself very vigorously in the king's cause; but he was afterwards imprisoned, by the parliament's order, in Winchester house, and had leave to depart thence in 1643. He afterwards compounded for his estate, but was ordered to leave the nation; when he went to France, and was sent on two embassies to pope Innocent X. from the queen, widow to Charles I. whose chancellor he then was. On the restoration of Charles II. he returned to London; where he died in 1665, aged 60.

DI'GERENT. *a.* (*digerens*, Latin.) That has the power of digestion, or causing digestion.

DIGEST, DIGESTUM, a collection of the Roman laws, ranged and digested under proper titles, by order of the emperor Justinian. The digest makes the first part of the Roman law, and the first vol. of the corpus, or body of the civil law, contained in fifty books. It was translated into Greek under the same emperor, and called Pandecta. See PANDECTS.

Cujus says, that digest is a common name for all books disposed in a good order and œconomy; and hence it is, that Tertullian calls the Gospel of St. Luke a Digest.

Hence, also, abridgements of the common law are denominated digests of the numerous cases, arguments, readings, pleadings, &c. dispersed in the year-books, and other reports and books of law, reduced under proper heads, or common places. The first was that of Statham, which comes as low as Henry VI.

To DIGE'ST. *v. a.* (*digero, digestum*, Lat.) 1. To distribute into various classes or repositories; to range methodically. 2. To concoct in the stomach (*Prior*). 3. To soften by heat, as in a boiler. 4. To range methodically in the mind (*Thomson*). 5. To reduce to any plan or method (*Shakspeare*). 6. To receive without loathing or repugnance; not to reject (*Peacham*). 7. To receive and enjoy (*Shakspeare*). 8. To dispose a wound to generate pus in order to a cure.

To DIGE'ST. *v. n.* To generate matter as a wound, and tend to a cure.

DIGE'STER. *s.* (from *digest.*) 1. He that digests or disposes. 2. He that digests or concocts his food (*Arbuthnot*). 3. A strong vessel, wherein to boil, with a very strong heat, any hard substances, so as to reduce them into a fluid state (*Quincy*). 4. That which causes or strengthens the concoctive power (*Temple*).

DIGE'STIBLE. *a.* (from *digest.*) Capable of being digested or concocted (*Bacon*).

DIGESTION, in physiology, the change that the food undergoes in the stomach, by which it is converted into a soft, equable, pultaceous mass called chyme, which, after it has passed through the pylorus, or lower orifice of the stomach, is converted by an additional process, into another substance, of a more fluid and milky character, denominated chyle.

The circumstances necessary to effect a healthy digestion of food, are, 1st, a certain degree of heat in the stomach. 2d. A free mixture of saliva with the food in the mouth. 3d. The secretion of a certain quantity of healthy gastric juice as well as of the juice of the other chylopoietic viscera, as the liver, spleen and pancreas, either thrown into the stomach or the smaller intestines. 4th. The natural peristaltic motion of the stomach. 5th. The pressure of the contraction and relaxation of the abdominal muscles and diaphragm. From these circumstances, the particles of the food are softened, dissolved, diluted, and intimately mixed into the soft pap, called chyme, which passes through the pylorus of the stomach into the duodenum.

In the process of digestion the two substances chiefly noticeable and of chief importance are the *gastric juice*, as the grand operating cause, and the *chyle*, the direct effect produced, and which constitutes the prima pabulum of the blood.

The *gastric juice* is separated by the minute arteries that open into the cavity of the stomach. It is, indeed, a most powerful solvent, but it does not act indiscriminately on all substances. To prove the truth of this observation, it is sufficient to observe, that if grains of corn are put into a perforated tube, and a gramnivorous bird is made to swallow it, the corn will remain the usual time in the stomach without alteration: whereas, if the husk of the grain is previously taken off, the whole of it will be converted into chyme. It is well known, too, that many substances pass unaltered through the intestines of animals, and consequently are not acted upon by the gastric juice. This is the case frequently with grains of oats when they have been swallowed by horses entire with their husks on. This is the case also with the seeds of apples, &c. when swallowed entire by man; yet these very substances, if they have been previously ground sufficiently by the teeth, are digested. It appears, therefore, that it is chiefly the husk or outside of these substances which resists the action of the gastric juice. We see also, that trituration greatly facilitates the conversion of food into chyme.

The gastric juice is not the same in all animals; for many animals cannot digest the food on which others live. The conium maculatum (hemlock), for instance, is a poison to man instead of food, yet the goat often feeds upon it. Many animals, as sheep, live wholly upon vegetables; and if they be made to feed on animals, their stomachs will not digest them: others again, as the eagle, feed wholly on animal substances, and cannot digest vegetables.

The gastric juice does not continue always of the same nature, even in the same animal; it changes gradually according to circumstances. Graminivorous animals may be brought to live on animal food; and after they have been accustomed to this for some time, their stomachs become incapable of digesting vegetables. On the other hand, those animals which naturally digest nothing but animal food may be brought to digest vegetables.

What is the nature of the gastric juice, which possesses these singular properties? It is evidently different in different animals; but it is a very difficult task, if not an impossible one, to obtain it in a state of purity. Various attempts have indeed been made by very ingenious philosophers to procure it; but their analysis of it is sufficient to shew us, that they have never obtained it in a state of purity.

The methods which have been used to procure gastric juice are, first, to kill the animal whose gastric juice is to be examined, after it has fasted for some time. By this method Spallanzani collected 37 spoonfuls from the first two stomachs of a sheep. It was of a green colour, undoubtedly owing to the grass which the animal had eaten. He found also half a spoonful in the stomach of some young crows which he killed before they had left their nest.

Small tubes of metal pierced with holes, and containing a dry sponge, have been swallowed by animals; and when vomited up, the liquid imbibed by the sponge is squeezed out. By this method, Spallanzani collected 481 grains of gastric juice from the stomachs of five crows.

A third method consists in exciting vomiting in the morning, when the stomach is without food. Spallanzani tried this method twice upon himself, and collected one of the times, 1 oz. 32 gr. of liquid; but the pain was so great, that he did not think proper to try the experiment a third time. Mr. Gosse, however, who could excite vomiting whenever he thought proper, by swallowing air, has employed that method to collect gastric juice.

Spallanzani has observed that eagles throw up every morning a quantity of liquid, which he considers as gastric juice; and he has availed himself of this to collect it in considerable quantities.

It is almost unnecessary to remark how imperfect these different methods are, and how far every conclusion drawn from the examination of such juices must deviate from the truth. It is impossible that the gastric juice obtained by any one of these processes can be pure; because in the stomach it must be constantly mixed with large quantities of saliva, mucus, bile, food, &c. It may be questioned, indeed, whether any gastric juice at all can be obtained by these methods; for as the intention of the gastric juice is to convert the food into chyme, in all probability it is only secreted, or at least thrown into the stomach, when food is present.

We need not be surprised, then, at the contradictory accounts concerning its nature given us by those philosophers who have attempted to examine it; as these relate not so much to the gastric juice, as to the different substances found in the stomach. The idea that the gastric juice can be obtained by vomiting, or that it is thrown up spontaneously by some animals, is, to say the least of it, very far from being probable.

According to Brugnatelli, the gastric juice of carnivorous animals, as hawks, kites, &c. has an acid and resinous odour, is very bitter, and not at all watery; and is composed of an uncombined acid, a resin, an animal substance, and a small quantity of muriat of soda. The gastric juice of herbivorous animals, on the contrary, as goats, sheep, &c. is very watery, a little muddy, has a bitter saltish taste, and contains ammonia, an animal extract, and a pretty large quantity of muriat of soda. Mr. Carminati found the same ingredients; but he supposes that the ammonia had been formed by the putrefaction of a part of their food, and that in reality the gastric juice of these animals is of an acid nature.

The accounts which have been given of the gastric juice of man are so various, that it is not worth while to transcribe them. Sometimes it has been found of an acid nature, at other times not. The experiments of Spallanzani are sufficient to shew, that this acidity is not owing to the gastric juice but to the food. He never found any acidity in the gastric juice of birds of prey, nor of serpents, frogs, and fishes. Crows gave an acidulous gastric juice only when fed on grain; and he found that the same observation holds with respect to dogs, herbivorous animals, and domestic fowls. Carnivorous birds threw up pieces of shells and coral without alteration; but these substances were sensibly diminished in the stomachs of hens, even when inclosed in perforated tubes. Spallanzani himself swallowed calcareous substances inclosed in tubes; and when he fed on vegetables and fruits, they were sometimes altered and a little diminished in weight, just as if they had been put into weak vinegar; but when he used only animal food, they came out untouched. According to this philosopher, whose experiments have been by far the most numerous, the gastric juice is naturally neither acid nor alkaline. When poured on the carbonat of potass, it causes no effervescence.

Such are the results of the experiments on the juices taken from the stomach of animals. No conclusion can be drawn from them respecting the nature of the gastric juice. But from the experiments which have been made on the digestion of the stomach, especially by Spallanzani, the following facts are established.

The gastric juice attacks the surface of bodies, unites to the particles of them, which it carries off, and cannot be separated from them by filtration. It operates with more energy and rapidity the more the food is divided, and its action is increased by a warm temperature.

The food is not merely reduced to very minute parts; its taste and smell are quite changed; its sensible properties are destroyed, and it acquires new and very different ones. This juice does not act as a ferment; so far from it that it is a powerful antiseptic, and even restores flesh already putrefied. There is not the smallest appearance of such a process; indeed, when the juice is renewed frequently, as in the stomach, substances dissolve in it with a rapidity which excludes all idea of fermentation. Only a few air-bubbles make their escape, which adhere to the alimentary matter, and buoy it up to the top, and which are probably extricated by the heat of the solution.

The properties of human *chyle* have not been investigated: but according to Dr. Fordyce, as far as experiments have been carried, the chyle of quadrupeds, a class of animals in which man is to be ranked as far as he is not improved by culture, is so similar as not to be distinguished, not even in natural classes the most opposite to each other in their food, structure, and habits of life. The chyle of a dog or of a wolf differs in nothing, as far as experiment has gone, from that of a sheep or of an ox.

The chyle consists of three parts, one part which is fluid and contained in the lacteals, but coagulate on extravasation. The second part consists of a fluid, which is coagulable by heat, and in all its properties hitherto observed, it is consonant to the serum of the blood.

The third part consists of globules, which render the whole white and opake. These globules have been supposed by many to be an expressed oil, but this has not been proved. Neither has it been perfectly demonstrated that sugar is contained in the chyle, although it has been made very probable. The difficulty of determining these points is, the small quantity that can be collected, the largest animals not supplying more than one ounce, or two, at the most. However, the part coagulating on extravasation, the part agreeing with serum in its qualities, the globular part, which in some animals, but not in quadrupeds, exists without giving whiteness to the chyle, alone, or along with sugar, form the essential parts of the chyle. A great many substances may enter the lacteals along with the chyle; even solids reduced to a fine powder. When indigo has been thrown into the intestine of a sheep, Dr. Fordyce has seen the chyle rendered quite blue; yet indigo is not soluble in water, but is a solid reduced to a very fine powder. Musk likewise gets into the chyle, giving it a strong smell, and a great variety of other substances of various colours, various tastes, and various smells; each of them giving colour, or taste, or smell to the chyle. The lacteals, however, reject some substances in whatever manner they are applied; amongst these are green vitriol and infusion of galls, for the chyle gives no colour when either is given with food to the animal, or thrown into the intestine, and it is afterward tried by them as tests of each other.

According to Dr. Fordyce, the chyle is not formed in the stomach. Milk is that food which comes nearest the chyle in its external appearance, and as it is formed for the nourishment of young animals whose digestive organs are weak, and necessity for nourishment great, it is obvious that chyle is ready prepared, or nearly so, in the vessels of the mother, to save the powers of digestion in the infant. Yet, on this entering the stomach, there is a juice which coagulates it in a few minutes after, retards it in the stomach, and retains it there for a considerable length of time. The same is produced on the white of egg, and serum of the blood. This of itself would sufficiently prove that there is a process which it must go through previous to its being formed into chyle. It further appears, that food dissolved in water so as to form a solution not capable of being coagulated and not detained in the stomach, gives very little nourishment in proportion to the same quantity of the same food given in a solid form, or a coagulable one. Hence a decomposition and recombination take place, but these do not appear to be the formation of chyle. Another circumstance is, that if it were chyle, the absorbents, which are numerous in the stomach, would take it up as fast as it is produced, and would have the appearance of and actually be lacteals, and be perceived; but if a living animal be opened at any time during digestion, there is no appearance of any chyle absorbed from the stomach, and hence there is none to be absorbed. If we throw milk into a portion of the jejunum, it will be absorbed by the lacteals, but if thrown into the stomach of the same animal, the milk will not be absorbed by the lymphatics; hence it may be said that the absorbents of the stomach refuse what those of the jejunum readily take up; but the case is, that the milk is instantly coagulated in the stomach, and not in the jejunum, which coagulation will perfectly prevent it from being absorbed; but all those substances which are not changed by the coagulating juice of the stomach are equally taken up by the lymphatics in the stomach and lacteals.

It therefore appears, that the use of the stomach is only to change the food into a new substance, the chyme, which is the only substance that can be converted into chyle. When this chyme is propelled into the duodedum, it is then converted into chyle, and not before; but the duodenum cannot have this action upon it, unless it has previously undergone the action of the stomach. There is nothing, therefore, in the whole doctrine of different species of food which can have any respect to any part of the body, excepting the stomach itself; for only those parts of it that are converted into chyme will pass into the duodenum and be converted into chyle; the other parts that have not undergone this change in the stomach will pass through the duodenum unchanged, and be evacuated. So that, according to Dr. Fordyce, it is perfectly immaterial what is the species of food, farinaceous matter, animal mucilage, apples, chicken, salmon or goose. So long as it has undergone the process of the stomach, and is converted into the matter formed by that process, it gives equally good nourishment, and is equally innoxious, because it becomes exactly the same. Sometimes a little whitish matter is seen about the pylorus, but this is not perfect chyle, for it is not seen in the absorbents of the stomach, even although in the middle of digestion the pylorus be tied round by introducing a piece of tape, forming a ligature round it, and retaining the remaining food in the stomach. The matter, therefore, formed in the stomach is converted into chyle in the duodenum, and continues to be converted in the jejunum. As the coagulating juice of the stomach, as far as can be judged, does not enter into the matter or chyme formed in the stomach from the food, nor the other juices of the stomach, only in so far as they supply water; so neither do the juices of the duodenum, the bile, pancreatic juice, or fluids secreted in the glands of the duodenum, or which may pass through the exhalents, at all appear to enter into any part of the chyle. For, according to Dr. Fordyce, if the ductus communis choledochus be obstructed by a stone, or if the body of an animal be opened when food has been thrown into the stomach, and the duct be tied up, by which the bile is prevented from getting into the duodenum; in either case the chyle is formed without any particle of bile being admitted; and the same may be said of the pancreatic juice; so that chyle is solely the product of the matter formed by the digestive process of the stomach. The chyle is always the same, but not always in the same proportion to the quantity of food. Scarcely any digestible matter is ever found in the duodenum, in the form it was thrown into the stomach; hence all of it seems to undergo some change or other.

Digestion (Chemical). An operation in which such matters as are intended to act tardily on each other are exposed to a low heat, continued for some time.

Digestion (Chirurgical). The disposition of a wound, abscess, or ulcer to a bland and healthy suppuration.

Digestion, also denotes farther; reduction to a plan (*Temple*). 2. The act of disposing a wound to generate matter.

DIGE'STIVE. *a.* (from *digest.*) 1. Having the power to cause digestion (*Brown*). 2. Capable by heat to soften and subdue (*Hale*). 3. Disposing; methodising (*Dryden*).

Dige'stive. *s.* An application which disposes a wound to generate matter (*Wiseman*).

DIGESTIVES. (*digestiva, medicamenta*; from *digero*, to dissolve). A term applied by surgeons to those substances which when applied to an ulcer or wound, promote suppuration: such are the unguentum resinæ flavæ, unguentum elemi, warm poultices, fomentations, &c.

DIGESTOR, in chemistry, a thick iron boiler furnished with a strong lid perfectly tight, that may be screwed down with force sufficient to resist the expansive power of the inclosed stream, whereby the water or other liquid which it contains may be heated considerably higher than the natural boiling point of water when unconfined. But as the strength of the vessel diminishes, and the force of the expansion increases as the heat is raised, there is a point at which the vessel would burst, and a dangerous explosion would take place, if it were not prevented by a safety-valve, with which all these vessels are furnished, and which will open and let part of the confined air escape when the expansion has reached a certain extent. There are some cases in which a digestor proves a useful part of chemical apparatus, but it is not often employed.

DI'GGER. *s.* (from *dig.*) One that opens the ground with a spade (*Boyle*).

DIGGES (Leonard), an English mathematician, born at Barham, in Kent, and educated at University college, Oxford. He wrote a treatise on Surveying, another on Geometry, and one entitled, Prognostication everlasting of right good Effect; or, Choice Rules to judge the Weather by Sun, Moon, and Stars, &c. He died about 1574. (*Watkins*).

Digges (Thomas), son of the preceding. He was educated at Oxford, after which he became muster-general of the forces sent by queen Elizabeth to the Netherlands. He wrote some military pieces, and some on astronomy, and other subjects of mathematics. He died in 1595. (*Watkins*).

Digges (Sir Dudley), the eldest son of the above, born in 1583, and educated at University college, Oxford. He received the honour of knighthood from James I. who sent him ambassador to Russia; but in the parliament of 1621 he resisted the court measures with great spirit, and continued to do so in the following reign, for which he was sent to the Tower, where, however, he did not remain long. In 1636 he was bought over by the grant of the mastership of the rolls, which he held but a short time, for he died in 1639. He wrote, 1. A Defence of Trade, 1615, 4to.; 2. A Discourse concerning the Rights and Privileges of the Subject, in a Conference desired by the Lords, and had by a Committee of both Houses, April 3, 1628, 4to.; 3. Sundry Speeches in Rushworth's Collections. His son Dudley, who died in 1643, was a loyal and learned man, and wrote some tracts against rebellion. (*Watkins*).

To **DIGHT.** *v. a.* (dihtan, to prepare, Saxon.) 1. To dress; to deck; to adorn (*Milton*). 2. To put on (*Spenser*).

DIGIT. *s.* (*digitus*, Latin.) 1. The measure of length containing three-fourths of an inch (*Boyle*). 2. The twelfth part of the diameter of the sun or moon; as noticed in eclipses. 3. Any of the numbers expressed by single figures; any number to ten (*Brown*).

DI'GITATED. *a.* (from *digitus*, Latin.) Branched out into divisions like fingers (*Brown*).

DIGITALIS. (*digitalis*, from *digitus*, a finger; because its flower represents a finger). Foxglove. In botany, a genus of the class and order didynamia, angiospermia. Calyx five-parted; corol campanulate, five-cleft, swelling; capsule ovate, two-celled, many-seeded. Four species; chiefly of the south of Europe: one, however, d. purpurea, purple foxglove, is a plant common to our own hedges, and well known to every one; the leaves of which have a bitter nauseous taste, but no remarkable smell; they have been long used externally to ulcers and scrophulous tumours with considerable advantage. Respecting the internal use of this plant, we are told of its good effects in epilepsy, scrophula, and phthisis; and Dr. Withering and others have established its reputation as a diuretic in dropsies. It is, however, necessary to observe, that this remedy must be cautiously administered; for the plant is of so deleterious a nature, that three grains of the dried leaf have been known to produce the most dreadful tormina.

From its effects on the animal system it appears to have a power of diminishing arterial action, and stimulating that of the lymphatics: and hence, if circumspectly employed, may be used advantageously in all cases in which such antagonism of action is indicated.

DIGITATE, in botany, applied to the leaf of a plant. Fingered leaf. When a simple or undivided petiole connects several distinct leaflets at the end of it. This is a sort of compound leaf; whilst the palmate, which in some measure resembles it, is a simple leaf. The digitate leaf, to correspond with the name, should have five leaflets spreading out like the open fingers: but Linnéus makes binate, ternate and quinate leaves to be species of the digitate; and the leaves of horse-chesnut, though they have more leaflets than five, are nevertheless called digitate.

DIGITUS. (*digitus*). In anatomy, a finger or toe.

Digitus manus. A finger. The fingers and thumb in each hand consist of fourteen bones, there being three to each finger; they are denominated according to their order the first, second, and third phalanx. The first is longer than the second, and the second longer than the third. What has been said of the fingers applies to the toes also.

Digitus pedis. A toe. See Digitus manus.

DIGLADIA'TION. *s.* (*digladiatio*, Lat.) A combat with swords; any quarrel (*Glan.*).

DIGLYPH, in architecture, a kind of imperfect triglyph, console, &c. having two channels.

DIGNE, a town of France, in the department of the Lower Alps, with a bishop's see. It is famous for its hot-baths. Lat. 44. 10 N. Lon. 6. 12 E.

DI'GNIFIED. *a.* (from *dignify*.) Invested with some dignity (*Ayliffe*).

DIGNIFICA'TION. *s.* (from *dignify*.) Exaltation (*Walton*).

To DI'GNIFY. *v. a.* (from *dignus*, and *facio*, Latin.) 1. To advance; to prefer; to exalt. 2. To honour; to adorn; to improve by some adventitious excellence, or honourable distinction (*Ben Jonson*).

DI'GNITARY. *s.* (from *dignus*, Latin.) A clergyman advanced to some dignity, to some rank above that of a parochial priest (*Swift*).

DI'GNITY. *s.* (*dignitas*, Latin.) 1. Rank of elevation (*Hooker*). 2. Grandeur of mien (*Clarissa*). 3. Advancement; preferment; high place (*Shakspeare*). 4. (Among ecclesiastics.) That promotion or preferment to which any jurisdiction is annexed (*Ayliffe*). 5. Maxim; general principle *Brown*).

Dignity, in the human character, the opposite of meanness. Man is endued with a sense of the worth and excellence of his nature: he deems it more perfect than that of the other beings around him; and he perceives that the perfection of his nature consists in virtue, particularly in virtues of the highest rank. To express that sense, the term dignity is appropriated. Further, to behave with dignity, and to refrain from all mean actions, is felt to be, not a virtue only, but a duty: it is a duty every man owes to himself. By acting in that manner, he attracts love and esteem: by acting meanly, or below himself, he is disapproved and contemned. This sense of the dignity of human nature reaches even our pleasures and amusements. If they enlarge the mind by raising grand or elevated emotions, or if they humanize the mind by exercising our sympathy, they are approved as suited to the dignity of our nature: if they contract the mind by fixing it on trivial objects, they are contemned as not suited to the dignity of our nature. Hence, in general, every occupation, whether of use or amusement, that corresponds to the dignity of man, is termed manly; and every occupation below his nature is termed childish.

To those who study human nature the question has always appeared intricate how it comes that generosity and courage are more esteemed, and bestow more dignity, than good nature, or even justice; though the latter contribute more than the former to private as well as to public happiness? The answer seems to be this. Human virtues, like other objects, obtain a rank in our estimation, not from their utility, which is a subject of reflection, but from the direct impression they make on us. Justice and good-nature are, according to this mode of estimation, a sort of negative virtues, that scarcely make any impression, but when they are transgressed: courage and generosity, on the contrary, producing elevated emotions, enliven greatly the sense of a man's dignity, both in himself and others; and hence courage and generosity are in more regard, and considered as of greater dignity, than the other virtues mentioned.

This leads us to examine more directly emotions and passions with respect to the present subject: and it will not be difficult to form a scale of them, beginning with the meanest, and ascending gradually to those of the highest rank and dignity. Pleasure felt as at the organ of sense, named corporeal pleasure, is perceived to be low; and when indulged to excess, is perceived also to be mean: for that reason persons of any delicacy dissemble the pleasure they take in eating and drinking. The pleasures of the eye and ear, having no organic feeling, and being free from any sense of meanness, are indulged without any shame: they even rise to a certain degree of dignity when their objects are grand or elevated. The same is the case of the sympathetic passions: a virtuous person behaving with fortitude and dignity under cruel misfortunes, makes a capital figure; and the sympathizing spectator feels in himself the same dignity. Sympathetic distress at the same time never is mean: on the contrary, it is agreeable to the nature of a social being, and has general approbation. The rank that love possesses in the scale depends in a great measure on its object: it possesses a low place when founded on external properties merely; and is mean when bestowed on a person of inferior rank without any extraordinary qualification: but when founded on the more elevated internal properties, it assumes a considerable degree of dignity. The same is the case of friendship. When gratitude is warm, it animates the mind; but it scarce rises to dignity. Joy bestows dignity when it proceeds from an elevated cause. If we can depend upon induction, dignity is not a property of any disagreeable passion: one is slight, another severe; one depresses the mind, another animates it; but there is no elevation, far less dignity, in any of them. Revenge, in particular, though it inflame and swell the mind, is not accompanied with dignity, not even with elevation: it is not however felt as mean or groveling, unless when it takes indirect measures for gratification. Shame and remorse, though they sink the spirits, are not mean. Pride, a disagreeable passion, bestows no dignity in the eye of a spectator. Vanity always appears mean, and extremely so where founded, as commonly happens, on trivial qualifications.

We proceed to the pleasures of the understanding, which possess a high rank in point of dignity. Of this every one will be sensible, when he considers the important truths that have been laid open by science: such as general theorems, and the general laws that govern the material and moral worlds. The pleasures of the understanding are suited to a man as a rational and contemplative being, and they tend not a little to ennoble his nature; even to the Deity he stretcheth his contemplations, which, in the discovery of infinite power, wisdom and benevolence, afford delight of the most exalted kind. Hence it appears, that the fine arts, studied as a rational science, afford entertainment of great dignity; superior far to what they afford as a subject of taste merely.

But contemplation, however in itself valuable, is chiefly respected as subservient to action; for man is intended to be more an active than a contemplative being. He accordingly shews more dignity in action than in contemplation: generosity, magnanimity, heroism, raise his character to the highest pitch: these best express the dignity of his nature, and advance him nearer to divinity than any other of his attributes.

Having endeavoured to assign the efficient cause of dignity and meanness by unfolding the principle on which they are founded, we proceed to explain the final cause of the dignity or meanness bestowed upon the several particulars above mentioned, beginning with corporeal pleasures. These, as far as useful, are, like justice, fenced with sufficient sanctions to prevent their being neglected. Hunger and thirst are painful sensations; and we are incited to animal love by a vigorous propensity: were corporeal pleasures dignified over and above with a place in a high class, they would infallibly overturn the balance of the mind, by outweighing the social affections. This is a satisfactory final cause for refusing to these pleasures any degree of dignity: and the final cause is not less evident of their meanness, when they are indulged to excess. The more refined pleasures of external sense, conveyed by the eye and the ear from natural objects and from the fine arts, deserve a high place in our esteem, because of their singular and extensive utility: in some cases they rise to a considerable dignity: and the very lowest pleasures of the kind are never esteemed mean or groveling. The pleasure arising from wit, humour, ridicule, or from what is simply ludicrous, is useful by relaxing the mind after the fatigue of more manly occupation: but the mind when it surrenders itself to pleasure of that kind, loses its vigour, and sinks gradually into sloth. The place this pleasure occupies in point of dignity is adjusted to these views: to make it useful as a relaxation, it is not branded with meanness; to prevent its usurpation, it is removed from that place but a single degree: no man values himself for that pleasure, even during gratification; and if it have engrossed more of his time than is requisite for relaxation, he looks back with some degree of shame.

In point of dignity, the social emotions rise above the selfish, and much above those of the eye and ear: man is by his nature a social being; and to qualify him for society, it is wisely contrived that he should value himself more for being social than selfish.

The excellency of man is chiefly discernible in the great improvements he is susceptible of in society: these, by perseverance, may be carried on progressively, above any assignable limits; and even abstracting from revelation, there is great probability that the progress begun here will be completed in some future state. Now, as all valuable improvements proceed from the exercise of our rational faculties, the author of our nature, in order to excite us to a due sense of these faculties, hath assigned a high rank to the pleasures of the understanding: their utility, with respect to this life as well as a future, entitles them to that rank.

But as action is the aim of all our improvements, virtuous actions justly possess the highest of all the ranks. These, we find, are by nature distributed into different classes, and the first in point of dignity assigned to actions that appear not the first in point of use: generosity, for example, in the sense of mankind is more respected than justice, though the latter is undoubtedly more essential to society; and magnanimity, heroism, undaunted courage, rise still higher in our esteem: the reason of which is explained above.

DIGNO'TION. *s.* (from *dignosco*, Latin.) Distinction; distinguishing mark (*Brown*).

To DIGRE'SS. *v. n.* (*digressus*, Latin.) 1. To turn aside out of the road. 2. To depart from the main design (*Locke*). 3. To wander; to expatiate (*Brerewood*). 4. To transgress; to deviate: not in use (*Shakspeare*).

DIGRE'SSION. *s.* (*digressio*, Latin.) 1. A passage deviating from the main tenour or design of a discourse (*Denham*). 2. Deviation (*Brown*).

DIGY'NIA. (δις and γυνη). The name of an order in Linnéus's Artificial System, comprehending those plants which have two pistils to a flower. This order is the second in the first thirteen classes, except the ninth.

DIHELIOS, the name given by Kepler to the transverse diameter of a planet's elliptic orbit.

DII, in the ancient mythology, a train of divinities which imagination arrayed in different forms, and armed with different powers. They were endowed with understanding, and were actuated by the same passions which daily afflict the human race. The Roman's, generally speaking, reckoned two classes of the gods, the dii majorum gentium, or dii consulentes, and the dii minorum gentium. The former were twelve in number, six males and six females; their names are, Juno, Vesta, Minerva, Ceres, Diana, Venus, Mars, Mercurius, Jupiter, Neptunus, Vulcan, Apollo. (See CONSENTES.) In the class of the latter, were ranked all the gods which were worshipped in different parts of the earth. Besides these, there were some called dii selecti, sometimes classed with the twelve greater gods. There were also some called demi-gods, that is, who deserved immortality by the greatness of their exploits, and for their uncommon services to mankind. Besides these, all the passions, and the moral virtues, were reckoned as powerful deities, and temples were raised to the goddess of concord, peace, &c. According to Hesiod, there were no less than 30,000 gods that inhabited the earth, and were guardians of men, all subservient to the power of Jupiter, and in succeeding ages we find temples erected, and sacrifices offered to unknown gods. In process of time not only good and virtuous men, who had been the patrons of learning and the supporters of liberty, but also thieves, and pirates, were admitted among the gods; and the Roman senate courteously granted immortality to the most cruel and abandoned of their emperors.

DIJON, an ancient city of France, lately an archbishopric, but now the episcopal town of the department of Cote d'Or. It contains about 20,000 inhabitants, and has an academy of sciences and belles-lettres. The public structures, and particularly the churches, are very fine. Lat. 47. 19 N. Lon. 5. 7 E,

DIJUDICA'TION. *s.* (*dijudicatio*, Latin.) Judicial distinction

DIKE. *s.* (ꝺic, Sax. *dyk*, Erse.) 1. A channel to receive water (*Pope*). 2. A mound to hinder inundations (*Cowley*).

To DILA'CERATE. *v. a.* (*dilacero*, Lat.) To tear; to rend; to force in two (*Brown*).

DILACERA'TION. *s.* (from *dilaceratio*, Lat.) The act of rending in two (*Arbuthnot*).

To DILA'NIATE. *v. a.* (*dilanio*, Latin.) To tear; to rend in pieces.

To DILA'PIDATE. *v. n.* To go to ruin.

DILAPIDATION, in ecclesiastical law, is where an incumbent of a church living suffers the parsonage-house or out-houses to fall down, or be in decay for want of necessary reparations; or it is the pulling down or destroying any of the houses or buildings belonging to a spiritual living, or destroying of the woods, trees, &c. appertaining to the same; for it is said to extend to committing or suffering any wilful waste, in or upon the inheritance of the church. By 13 Eliz. c. 10. if any ecclesiastical persons, who are bound to repair the buildings whereof they are seised in right of their place or function, suffer them to fall into decay for want of repair, and make fraudulent gifts of their personal estate, with intent to hinder their successors from recovering dilapidations against their executors or administrators, in such case the successor shall have like remedy in the ecclesiastical court, against the grantee of such personal estate, as he might have against the executor or administrator of the predecessor. By 14 Eliz. c. 11. all moneys recovered by dilapidations shall within two years be employed upon the buildings for which they were paid, on pain of forfeiting double so much as shall not be employed, to the queen.

DILATABI'LITY. *s.* (from *dilatable.*) The quality of admitting extension (*Ray*).

DILA'TABLE. *a.* (from *dilate.*) Capable of extension (*Arbuthnot*).

DILATA'TION. *s.* (from *dilatatio*, Lat.) 1. The act of extending into greater space: opposed to *contraction* (*Holder*). (See EXPANSION.) 2. The state of being extended (*Newton*).

To DILA'TE. *v. a.* (*dilato*, Latin.) 1. To extend; to spread out (*Waller*). 2. To relate at large; to tell diffusely and copiously (*Sh.*).

To DILA'TE. *v. n.* 1. To widen; to grow wide (*Addison*). 2. To speak largely and copiously (*Clarendon*).

DILA'TOR. *s.* (from *dilate.*) That which widens or extends (*Arbuthnot*).

DI'LATORINESS. *s.* (from *dilatory.*) Slowness; sluggishness.

DI'LATORY. *a.* (*dilatoire*, Fr.) Tardy; slow; sluggish (*Otway*).

DILATORY PLEAS, in law, are such as are put in merely for delay, and are of three kinds: 1. To the jurisdiction of the court, alleging, that it ought not to hold plea of the matter in hand, as belonging to some other court. 2. To the disability of the plaintiff, by reason whereof he is unable to commence or continue the suit, as that he is outlawed, attainted, an infant, or the like. 3. In abatement, as for some defect in the writ, as a misnomer of the defendant, or other want of form in any material respect. These pleas were formerly used as merely dilatory, without any foundation of truth, and calculated only for delay; but now by stat. 4 and 5 Anne, c. 16. no dilatory plea shall be admitted, without affidavit made of the truth thereof, or some probable matter shewn to the court to induce them to believe it true. 3 Black. 301.

DILATRIS, in botany, a genus of the class triandria, order monogynia. Coral six-petalled, hairy; third filament less than the others; stigma simple; capsule globular, inferior, three-celled. Three species, all natives of the Cape. D. corymbosa, the most elegant, is a villous-plant except in the inside of the flowers; with leaves lanceolate, smooth; umbel fastigiate; flowers dark-purple

DILE'CTION. *s.* (*dilectio*, Latin.) The act of loving; kindness (*Boyle*)

DILEMMA, Διλημμα, in logic, an argument consisting of two or more propositions, so disposed, that grant which you will of them you will be pressed by the conclusion.

The word is formed from the Greek δις, *lis*, twice, and λημμα, *sumptio.*

A dilemma is an argument consisting of two contrary parts, or sides, either of which catches the adversary. And hence it is also called syllogismus cornutus, a horned syllogism, its horns being so disposed, that if you avoid the one, you run upon the other.

It is also called crocodilinus, by reason that as the crocodile leads such as follow it into the water, and pursues such as fly it, to destroy them; so, whatever the adversary either affirms, or denies, in this kind of syllogism, is turned to his disadvantage.

Cicero uses this fine dilemma, to prove, that all pain is to be borne with patience: "Omnis dolor aut est vehemens, aut levis; si levis, facile feretur; si vehemens, certe brevis futurus est.

Nor must we here omit that beautiful dilemma of Tertullian, whereby he clears the Christians, and accuses Trajan, who had forbad the seeking them out, and yet ordered them to be punished when found: "O sententiam necessitate confusam! negat inquirendos, ut innocentes; et mandat puniendos, ut nocentes: parcit et sævit, dissimulat et animadvertit! quid temetipsum censura circumvenis? si damnas, cur non et inquiris? si non inquiris, cur non et absolvis?"

For a dilemma to be legitimate, there are two things required: 1. A full enumeration of parts; thus that of Aristippus, whereby he dissuades from marriage, is invalid, as being defective in the enumeration; there being a middle degree, or form, between handsome and ugly. 2. That the dilemma press the adversary alone, and that the person who makes it be not liable to have it retorted upon him. This was the case in that celebrated dilemma of the sophist Protagoras, which the areopagites, with all their wisdom, were not able to resolve.

A youth named Evathlus, engaged with Protagoras to learn dialectics upon condition that he should pay him a large sum of money, the first cause he pleaded, in case he gained the same. Evathlus, when fully instructed, refusing to pay the condition, Protagoras brings his action, arguing thus: "You must pay the money, however the cause go; for if I gain, you must pay in consequence of the sentence, as being cast in the cause; and if you gain it, you must pay in pursuance of our covenant. "Nay," retorts Evalthus, "which way soever the cause go, you will have nothing: for if I prevail, the sentence gives it, that nothing is due to you; and if I lose, then there is nothing due by the covenant."

DILETTANTE. (Ital.; equivalent with *amateur*, French. The word is formed from *dilettare*, of *dilectator*, Lat.) One who gives and receives delight from the succession and combinations of sounds in music.

DILI. See Delos.

DI'LIGENCE. *s.* (*diligentia*, Latin.) Industry; assiduity; constancy in business (*Peter*).

Dr. Barrow has five fine sermons, on diligence or industry in general; on industry in our general calling, as Christians; in our particular calling, as gentlemen; and in our particular calling, as scholars.

Diligence, in Scots law, signifies either that care and attention which parties are bound to give, in implementing certain contracts or trusts, and which varies according to the nature of the contract: or it signifies certain forms of law, whereby the creditor endeavours to operate his payment, either by affecting the person or estate of the debtor.

DI'LIGENT. *a.* (*diligens*, Latin.) 1. Constant in application; persevering in endeavour; assiduous; not idle (*Proverbs*). 2. Constantly applied; prosecuted with activity and perseverance (*Deuteronomy*).

DI'LIGENTLY. *ad.* With assiduity; with heed and perseverance (*Dryden*).

DILL, in botany. See Anethum.

DILLA (Mount), a remarkable promontory of the coast of Malabar, 20 miles N. by W. of Tillicherry. Lon. 75. 2 E. Lat. 12. 1 N.

DILLENIA, in botany, a genus of the class polyandria, order polygynia. Calyx five-leaved; petals five; capsules many-seeded, united, filled with pulp. Eight species; all Indian plants; some trees, and some shrubs.

DILLENIUS (John James), an eminent botanist, born at Darmstadt in Germany, in 1681, and educated at the university of Giessen. He contributed several curious papers to the Miscellanea Curiosa, and, in 1721, accompanied Dr. Sherard to England, where he spent the remainder of his days. Soon after his arrival he undertook a new edition of Ray's Synopsis

Stirpium Britannicarum. He was appointed the first botanical professor at Oxford on Dr. Sherard's foundation, and there he continued to reside till his death. In 1735 the university admitted him to the degree of M.D. and the year following he was visited by Linnéus. He died in 1747. He published an elaborate work entitled, Hortus Elthamensis, and a History of Mosses.

DILLWYNIA, in botany, a genus of the class decandria, order monogynia. Perianth bell-shaped, two-lipped; the upper, of two oblique divaricated segments, lower, of three direct, nearly equal ones; corol papilionaceous, five-petalled; standard broad, almost kidney-shaped, with a linear claw of its own length; style short and thick, bent upwards; stigma obtuse, downy; legume ovate, inflated, of one cell; seeds two. Five species; bushy shrubs of New Holland.

DILU'CID. *a.* (*dilucidus*, Latin.) 1. Clear; not opaque. 2. Clear; plain; not obscure.

To DILU'CIDATE. *v. a.* (*dilucidare*, Latin.) To make clear or plain; to explain; to free from obscurity (*Brown*).

DILUCIDA'TION. *s.* (*dilucidatio*, Lat.) The act of making clear; explanation.

DI'LUENT. *a.* (*diluens*, Latin.) Having the power to thin other matter.

Diluents, in medicine, Attenuants, which see.

To DILU'TE. *v. a.* (*diluo*, Latin.) 1. To make thin (*Locke*). 2. To make weak (*Newton*).

DILU'TER. *s.* (from *dilute*.) That which makes any thing else thin (*Arbuthnot*).

DILU'TION. *s.* (*dilutio*, Latin.) The act of making any thing thin or weak (*Arbuthnot*).

DILU'VIAN. *a.* (from *diluvium*, Latin.) Relating to the deluge (*Burnet*).

DIM. *a.* (ꝺimme, Saxon.) 1. Not having a quick sight (*Davies*). 2. Dull of apprehension (*Rogers*). 3. Not clearly seen (*Locke*). 4. Obstructing the act of vision; not luminous; somewhat dark (*Spenser*).

To Dim. *v. a.* (from the adjective.) 1. To cloud; to darken (*Locke*). 2. To make less bright; to obscure (*Spenser*).

DIMACHÆRUS, in antiquity, a gladiator who fought with two swords.

DIMENSION, in geometry, is either length, breadth, or thickness; hence a line has one dimension, viz. length; a superficies two, viz. length and breadth; and a body or solid has three, viz. length, breadth, and thickness.

Dimension, in algebra, a term applied to the powers of quantities in equations. Thus, in a simple equation, the unknown quantity is said to be of one dimension; in a quadratic, of two dimensions; in a cubic, of three; and so on.

DIME'NSIONLESS. *a.* (from *dimension*.) Without any definite bulk (*Milton*).

DIME'NSIVE. *a.* (*dimensus*, Latin.) That marks the boundaries or outlines (*Davies*).

DIMICA'TION. *s.* (*dimicatio*, Latin.) A battle; the act of fighting; contest.

DIMIDIA'TION. *s.* (*dimidiatio*, Latin.) The act of halving; division into two equal parts.

To DIMI'NISH. *v. a.* (*diminuo*, Latin.) 1. To make less by abscission or destruction of any part: the opposite to *increase* (*Locke*). 2. To impair; to lessen; to degrade (*Milton*). 3. To take any thing from that to which it belongs: the contrary to *add* (*Deuteronomy*).

To Dimi'nish. *v. n.* To grow less; to be impaired (*Dryden*).

DIMINISHED INTERVAL, in music, is such as, by the application of a sharp or a natural, to the lower tone, or of a flat or a natural, to the upper tone, becomes contracted within its natural compass. Thus, a *diminished second*, is a major semitone lessened by a minor semitone. A *diminished third*, is a third minor lessened by a semitone minor. A *diminished fifth*, is a perfect fifth lessened by a minor semitone. And a *diminished octave*, is an octave lessened by a minor semitone. In every diminished interval, the alteration is that of a minor semitone.

DIMI'NISHINGLY. *ad.* (from *diminish*.) In a manner tending to vilify, or lessen (*Locke*).

DIMINU'TION. *s.* (*diminutio*, Latin.) 1. The act of making less (*Hooker*). 2. The state of growing less (*Newton*). 3. Discredit; loss of dignity (*Philips*). 4. Deprivation of dignity; injury of reputation (*K. Charles*).

Diminution, in architecture, a contraction of the upper part of a column, whereby its diameter is made less than that of the lower part.

To attain those two important points in architecture, strength, and the appearance of strength, all architects have made their columns less above than below, which is called their diminution. Some have likewise made them a little bigger towards the middle than at the bottom, which is called their swelling. The Gothic architects, indeed, observe neither diminution nor swelling; their columns are perfectly cylindrical; for which reason they are properly called pillars, in contradistinction to columns.

The first architects probably made their columns in straight lines, in imitation of trees; so that their shaft was a conic frustum: but finding this form abrupt and disagreeable, they made use of some curve, which springing from the extremities of the upper and lower diameters of the column, swelled beyond the sides of the cone, and by that means gave a more pleasing figure to the contour.

For the best methods of diminution, see Architecture, sect. ii.

DIMI'NUTIVE. *a.* (*diminutivus*, Latin.) Small; little; narrow; contracted (*South*).

Dimi'nutive *s.* (from the adjective.) 1. A word formed to express littleness; as, *manikin*, a *little man* (*Cotton*). 2. A small thing: not in use (*Shakspeare*).

In Latin, Italian, English, and most other tongues, diminutives are formed from primitives, by the addition of a few letters, or syllables: in French, the case is frequently otherwise, the diminutive being sometimes shorter than the primitive, sometimes of the same length.

They have a pleasing effect in that celebrated address of Adrian to his departing soul, which begins,

> Animula, vagula, blandula
> Hospes comesque corporis, &c.

DIMI'NUTIVELY. *ad.* (from *diminutive.*) In a diminutive manner.

DIMI'NUTIVENESS *s.* (from *diminutive.*) Smallness; littleness; pettyness.

DI'MISH. *a.* (from *dim.*) Somewhat dim (*Swift*).

DIMI'SSORY. *a.* (*dimissorius*, Lat.) That by which a man is dismissed to another jurisdiction (*Ayliffe*).

DIMITY, a kind of cotton cloth originally imported from India, and now manufactured in great quantities in various parts of Britain, especially Lancashire. Dimity is in its fabric similar to fustian; but is ornamented in the loom, either with stripes or fanciful figures, and when woven is seldom dyed, but commonly bleached of a pure white.

DI'MLY. *ad.* (from *dim.*) 1. Not with a quick sight; not with a clear perception (*Milton*). 2. Not brightly; not luminously (*Boyle*).

DI'MNESS. *s.* (from *dim.*) 1. Dulness of sight 2. Want of apprehension; stupidity (*Decay of Piety*). 3. Obscurity; not brightness.

DIMOCARPUS. In botany, a genus of the class octandria, order monogynia. Calyx five-cleft; corol five-petalled; berries two, one-seeded; seed large. One species; a Chinese plant, the litchi of Du Halde.

DI MOLTO, in music, *very*, as *Di-molto largo*, very slow.

DIMORPHA. In botany, a genus of the class diadelphia, order decandria. Calyx three or four cleft; banner very large; crenulate; wingless and heelless; legume one-seeded; compressed, large. Two species; both Guiana trees, from twenty to thirty feet high.

DI'MPLE. *s.* (*dint*, a hole; *dintle*, a little hole; by a careless pronunciation *dimple*, *Skinner.*) A small cavity or depression in the cheek, chin, or other part (*Grew*).

To DI'MPLE. *v n.* (from the noun.) To sink in small cavities (*Dryden*)

DI'MPLED. *a.* (from *dimple.*) Set with dimples (*Shakspeare*).

DI'MPLY. *a.* (from *dimple.*) Full of dimples; sinking in little inequalities (*Warton*).

DIN. *s* (ꝺyn, Sax.) A loud noise; a violent and continued sound (*Smith*).

To DIN. *v. a.* (from the noun.) 1. To stun with noise (*Otway*). 2. To impress with violent and continued noise (*Swift*).

D-IN-ALT, that musical note, which is a twelfth above G, or the treble cliff note.

DINANT, a town of France, in the department of the North Coast, seated on a craggy mountain, at the foot of which is the river Rance, 20 miles S. of St. Malo. Lon. 1. 58 W. Lat. 48. 20 N.

To DINE. *v. n.* (*diner*, French.) To eat the chief meal about the middle of the day (*Clarendon*).

To DINE. *v. a.* To give a dinner to; to feed (*Dryden*).

DINE'TICAL. *a.* (δινητικος.) Whirling round; vertiginous (*Ray*).

To DING. *v. a.* pret. *dung*. (*dringen*, Dutch.) 1. To dash with violence. 2. To impress with force.

To DING. *v. n.* To bluster; to bounce; to huff: a low word (*Arbuthnot*).

DING-DONG. *s.* A word by which the sound of bells is imitated (*Shakspeare*).

DI'NGLE. *s.* (from ꝺen, or ꝺin, a hollow, Sax.) A hollow between hills; a dale (*Milt.*).

DINGWALL, a royal borough in Ross-shire, seated at the head of the Frith of Cromarty. Lat. 57. 45 N. Lon. 4. 23 W.

DINICS. (*dinica*, from δινος, a giddiness.) Medicines which relieve a vertigo or giddiness of the head.

DI'NING-ROOM. *s.* (*dine*, and *room.*) The principal apartment of the house; the room where entertainments are made (*Taylor*).

DINNER, the meal taken about the middle of the day. The word is derived from the French *disner*, which Du Cange derives from the barbarous Latin *disnare*. Henry Stephens derives it from the Greek δειπνειν; and will have it written *dipner*. Menage deduces it from the Italian *desinare*, to dine; and that from the Latin *desinere*, to leave off work. It is generally agreed to be the most salutary to make a sufficient dinner, and to eat sparingly at supper. This is the usual practice among us. The French, however, in imitation of the ancient Romans, defer their good cheer till the evening; and people of fashion in England seldom dine till 5 or 6 o'clock in the afternoon.

DINNER-TIME. *s.* The time of dining.

DINOCRATES, an architect of Macedonia, who proposed to Alexander to cut mount Athos in the form of a statue, holding a city in one hand, and in the other a bason, into which all the waters of the mountain should empty themselves. This project Alexander rejected as chimerical, but he employed the talents of the artist in building and beautifying Alexandria. He began to build a temple in honour of Arsinoe, by order of Ptolemy Philadelphus, in which he intended to suspend a statue of the queen, by means of loadstones. His death, and that of his royal patron, prevented the execution of a work which would have been the admiration of every age.

DINOSTRATES, in biography, a famous mathematician of the Platonic school, the brother of Menechmus, and disciple of Plato. Pursuing the steps of his brother, who applied the theory of the conic sections, Dinostrates is said to have made many geometrical discoveries; but he is particularly distinguished as the inventor of the QUADRATRIX, which see. Montucla, however, observes (Hist. Mathem.

v. i. p. 181.) that there is some reason for ascribing the original invention of this curve to Hippias of Elœa, an ingenious philosopher and geometer, contemporary with Socrates.

DINT. *s.* (ꝺẏnꞇ, Saxon.) 1. A blow; a stroke (*Milton*). 2 The mark made by a blow; the cavity remaining after a violent pressure (*Dryden*). 3. Violence; force; power (*Addison*).

To Dint. *v. a.* To mark with a cavity by a blow, or violent impression (*Donne*).

DINUMERATION. *s.* (*dinumeratio*, Lat.) The act of numbering out singly.

DIO (Chrysostom), a celebrated Grecian orator, was the son of one Pasicrates, and was born at Prusa in Bithynia. He was familiarly acquainted with Apollonius of Tyana, and Euphrates of Tyre, during the reigns of Nero and Vespasian. When he arrived at manhood, he travelled into Egypt and other countries for the improvement of his understanding by a survey of their curiosities, and by conversation with their inhabitants. On his return to Rome, his freedom of speech, in conjunction with his friendship for a man of honour, whom Domitian had put to death, endangered his life with that despotic monster, and drove him into banishment, about the year ninety-four of the Christian æra, with no other companions of his exile besides Plato's dialogue on the Immortality of the Soul, and a single oration of Demosthenes. From the manner in which he mentions the Getæ, Mysians, and Thracians, in several passages of his works, he seems to have penetrated, during this pilgrimage, to the very extremities of the Roman empire. He was recalled from banishment by Nerva, and was caressed by that emperor, but more particularly by Trajan, who conspicuously displayed his esteem and affection, by admitting our philosopher to accompany him on extraordinary occasions, when he rode in his triumphal chariot through the city. That magnanimous prince, the sovereign of the world, did not think himself disgraced by being seen in the procession of imperial Rome with a man of letters sitting by his side. Dio's character, as a moral preceptor, an eloquent writer, and a graceful speaker, was in high estimation with his contemporaries and his successors in the same rhetorical department. He acquired the additional name of Cocceianus from his patron Cocceius, and of Chrysostom, or golden mouthed, from the elegance and purity of his compositions: a name which has occasioned a frequent confusion of our Dio Chrysostom, the heathen philosopher, with John Chrysostom, the Christian preacher, so denominated for the same solid and splended excellences of his style. In person our author is reasonably presumed, from various circumstances of praise and censure on these topics in his orations. to have been slender, and of inferior stature. He was married, brought up children, and lived to a good old age.

There are still extant 80 of Dio's orations, and some other of his works; the best edition of which is that of Hermand Samuel Raimarus, in 1750, in folio. Some Select Essays of this author were lately translated from the Greek by Mr. Gilbert Wakefield, and published with notes. The above account of Dio is taken from the preface of that ingenious and learned translator.

DIOCE'SAN. *s.* (from *diocess.*) A bishop, as he stands related to his own clergy or flock (*Tatler*).

DIOCESE, or Diocess, the circuit or extent of the jurisdiction of a bishop. The word is formed from the Greek διοικησις, government, administration; formed of διοικεω, which the ancient glossaries render *administro, moderor, ordino:* hence διοικησις της πολεως, the administration or government of a city. In England, the provinces are two, Canterbury and York; whereof Canterbury includes twenty-one dioceses, or sees of suffragan bishops; and York three, besides the bishopric of the Isle of Man, which was annexed to the province of York by king Henry the VIII.

Diocese is also used in ancient authors, &c. for the province of a metropolitan. *Diocæsis*, διοικησις, was originally a civil government, or prefecture, composed of different provinces. The first division of the empire into dioceses is ordinarily ascribed to Constantine; who distributed the whole Roman state into four, viz. the diocese of Italy, the diocese of Illyria, that of the East, and that of Africa And yet, long before Constantine, Strabo, who wrote under Tiberius, takes notice, that the Romans had divided Asia into dioceses; and complains of the confusion such a division occasioned in geography, Asia being no longer divided by people, but by dioceses, each whereof had a tribunal or court, where justice was administered. Constantine, then, was only the institutor of those large dioceses, which comprehended several metropoles and governments; the former dioceses only comprehending one jurisdiction or district, or the country that had resort to one judge, as appears from this passage in Strabo, and (before Strabo) from Cicero himself, lib. iii. epist. ad famil. 9. and lib. xiii. ep. 67.

Thus, at first, a province included many dioceses; and afterwards a diocese came to comprise several provinces. In after times the Roman empire became divided into 13 dioceses or prefectures; though, including Rome and the suburbicary regions, there were 14. These 14 dioceses comprehended 120 provinces: each province had a proconsul, who resided in the capital or metropolis; and each diocese of the empire had a consul, who resided in the principal city of the district. On this civil constitution, the ecclesiastical one was afterwards regulated: each diocese had an ecclesiastical vicar or primate, who judged finally of all the concerns of the church within his territory. At present there is some further alteration: for diocese does not now signify an assemblage of provinces; but is limited to a single province under a metropolitan, or more commonly to the single jurisdiction of a bishop. Gul. Brito affirms diocese to be properly the territory and extent of a baptismal or parochial church, whence some authors use the word to signify a simple parish. See PARISH.

DIOCLEIA, an ancient Athenian festival.

DIOCLETIANUS (Caius Valerius Jovius), *Diocletian*, a celebrated Roman emperor, was born of an obscure family in Dalmatia. He was first a common soldier, and by merit he gradually rose to the office of a general, and at the death of Numerian, he was invested with imperial power. In this high station he rewarded the virtues of Maximilian, by making him his colleague on the throne. He created two subordinate emperors, Constantius and Galerius, whom he called Cæsars. Diocletian has been celebrated for his military virtues; and though naturally unpolished by education, yet he was the friend and patron of learning and genius. He was resolute, active, and well acquainted with the arts, which will endear a sovereign to his people, and make him respectable even in the eyes of his enemies. His cruelty, however, against the followers of Christianity, has been deservedly branded; he raised a most violent persecution against the Christians. After he had reigned 21 years in the greatest prosperity, he publicly abdicated the crown at Nicomedia, on the first of May, A.D. 304, and retired to a private station at Salona. Maximilian, his colleague, followed his example; but not from choice. He lived nine years after his abdication at Salona, and died in the 68th year of his age. Some time previous to his death he was seized with an agitation of body and mind, which allowed him no rest either day or night; he kept rolling himself on the ground, and spent his whole time in sighs, groans, and tears. His body became putrid, and the flesh fell away from his bones in small portions, with so horrible a stench that none were able to go near him, for some days before he died. Yet after his death Licinius placed him among the gods, after the usual manner.

DIODIA, in botany, a genus of the class tetrandria; order monogynia. Corol one-petalled, funnel-form, capsule two-celled, two-seeded. Six species; all West Indian and American plants.

DIODON, in zoology, a genus of the class pisces, order branchiostega. Jaws bony, extended, undivided; aperture of the gills linear; body armed on all sides with long, strong, moveable spines, varied with white and black, hollowed within, and covered with the common skin; no ventral fin. Three species, as follow:

1. D. trystrix: of which there are four varieties.

α. Nearly spherical; spines triangular.
β. Somewhat round; spines shorter, triangular.
γ. Roundish; spines triangular at the base.
δ. Conic-oblong, spines long, a little rounded.

Inhabits the Indian and American seas; grows to two feet in length; body oblong, pale brown; head small, eyes large, irids yellow; has the power of erecting and depressing its spines; and of inflating and contracting its body. The flesh is hard and rank.

2. D. atinga; of which there are two varieties.

α. Oblong; spines round.
β. Spines of the neck and head longer

Inhabits the American seas, and round the Cape of Good Hope. From twelve to fifteen inches long; body compressed at the sides, blueish, back broad, round and blackish; belly white, broad, spotted with black; head small, eyes small, irids yellow. Has the same compressive and expansile power as d. trystrix.

3. D. mola. Vertically semi-oval, nearly truncate behind; belly carinate; dorsal, anal, and caudal fins united. Inhabits the Atlantic and Ethiopian seas; body compressed, thicker at the head, truncate behind, and terminating in a longitudinal thin fin, silvery white, growing gradually darker towards the back. The name of sun-fish is given by some naturalists to this genus, but improperly. The real sun-fish is a species of SETRODON, which see.

DIODORUS, an historian, surnamed Siculus, because he was born at Argira in Sicily. He wrote an history of Egypt, Persia, Syria, Media, Greece, Rome, and Carthage, which was divided into 40 books, of which only 15 are extant, with some few fragments. This valuable composition was the work of an accurate enquirer, and it is said that he visited all the places of which he has made mention in his history. It was the labour of 30 years. He often wanders far from the truth. His style is neither elegant, nor too laboured; but it manifests great simplicity, and unaffected correctness. The historian flourished about 44 years B.C. The last edition of his works is that of Amsterdam, 1746, in 2 vols. folio.

DIŒCIA. The name of the twenty-second class in Linnéus's artificial system, comprehending those plants which have no hermaphrodite flowers; but male and female flowers on distinct individuals. Mares et fœminæ habitant in diversis thalamis et domiciliis.

DIOGENES, a celebrated Cynic philosopher of Sinope, banished from his country for coining false money. From Sinope he retired to Athens, where he became the disciple of Antisthenes, the head of the Cynics. Antisthenes at first refused to admit him into his house, and even struck him with a stick. Diogenes calmly said, Strike me, Antisthenes, but never shall you find a stick sufficiently hard to remove me from your presence, whilst there is any thing to be gained from your conversation and acquaintance. Such firmness recommended him to Antisthenes, and he became his most devoted pupil. He dressed himself in the Cynical garment, and walked about the streets with a tub on his head, which served him as a house and a place of repose. Such singularity, joined to the greatest contempt for riches, soon gained him reputation, and Alexander the Great condescended to visit the philosopher in his tub. He asked Diogenes if there was any thing in which he could gratify or oblige him? "Get out of my sun-shine," was the only answer from the philosopher. Such an independence of mind so pleased the monarch, that he turned to his courtiers, and said, "Were I not Alexander, I would wish to be Diogenes." In reply to one who asked Diogenes at what time he ought to dine, he said, "If you are a rich man, when you *will*; if you are poor, when you *can*." "How happy," said one, "is Calisthenes in living with Alexander." "No," said Diogenes, "he is not happy; for he must dine and sup when Alexander pleases." "Would you be revenged upon your enemy," said Diogenes, "be virtuous, that he may have nothing to say against you." One day, on meeting Plato, he trod upon his robe, exclaiming, "I trample under foot the pride of Plato:" the reply of Plato, though cited a thousand times, must be once more transcribed: it was, "Yes, with far greater pride." Diogenes was once sold as a slave, but his magnanimity so pleased his master, that he made him the preceptor of his children, and the guardian of his estates. After a life spent in the greatest misery and indigence, he died B.C. 324, in the 96th year of his age. The inhabitants of Sinope raised statues to his memory, and the marble figure of a dog was placed on a high column erected on his tomb.

Diogenes (Laertius), so called from Laerta in Cilicia, where he was born, an ancient Greek author, who wrote ten books of the Lives of the Philosophers, still extant. In what age he flourished is not easy to determine. The oldest writers who mention him are Sopater Alexandrinus, who lived in the time of Constantine the Great, and Hesychius Milesius, who lived under Justinian. There have been several editions of his Lives of the Philosophers; but the best is that printed in two volumes 4to. at Amsterdam, in 1693.

DIOGMUS. (διωγμος, from διωκω, to persecute.) A distressing palpitation of the heart.

DIOICOUS. (δις, and οικος, a house.) A diœcous plant. Having male and female flowers on distinct individuals.

DIOMEDEA. Albatross. In zoology, a genus of the class aves, order anseres. Bill straight; upper mandible hooked at the point, lower truncate; nostrils oval, wide, prominent, lateral; tongue very small; feet four-toed, all placed forward. Four species; as follow:

1. D. exulans. Wandering albatross; man of war bird. White; back and wings with white lines; bill pale yellow; legs flesh colour; quill feathers black; tail rounded, lead colour.

There are two other varieties from slight differences of colour. Inhabits most seas; but chiefly within the tropics: from three and a half to four feet long; feeds on fishes and mollusca; is gregarious and migrates; lays numerous white eggs on shore as large as those of a goose; whose white is not to be hardened by boiling. The flesh is tough. Tail-feathers thirteen: wings when extended from ten to thirteen feet. Sometimes swallows a salmon of such length that the whole cannot enter into the stomach, and the tail part hangs out at the mouth; at which period it is easily knocked down and killed; yet otherwise sternly resists with its bill. The male watches the female while sitting, and supplies her with food. The cry is harsh and braying. The large intestine is used as a floating bladder to buoy up fishing nets; the bones are employed by the natives for tobacco pipes, needle-cases and other trinkets.

2. D. spadicea. Chocolate albatross. Bill whitish; body deep chesnut brown; belly pale; face and wings beneath, whitish. Another variety entirely grey-brown. The first inhabits the Pacific ocean: three feet long. The second, China; two feet and a half long.

3. D. chlororhyncos. Yellow-nosed albatross. White: bill black; heel of the upper mandible and base of the lower yellow; body above black-blue, beneath white. Inhabits the Pacific ocean; about three feet long.

4. D. fuliginosa. Sooty albatross. Brown; head, bill, tail, quill-feathers, and claws sooty brown; area of the eyes white. Inhabits the seas within the arctic circle; three feet long.

DIOMEDES, in biography, son of Tydeus and Deiphyle, was king of Ætolia, and one of the bravest of the Grecian chiefs in the Trojan war. He often engaged Hector and Æneas, and wounded Mars and Venus in battle. He went with Ulysses to steal the Palladium from the temple of Minerva, in Troy, and assisted in murdering Rhesus, king of Thrace, and carrying away his horses. During his long absence, his wife Ægiale forgot her marriage vows, and prostituted herself to Cometes, one of her servants. This infidelity was highly displeasing to Diomedes. He resolved to abandon his native country, which was the seat of his disgrace. He came to that part of Italy which has been called Magna Græcia, where he built a city, which he called Argyrippa, and married the daughter of Daunus, the king of the country. He died there in extreme old age, or, according to a certain tradition, he perished by the hand of his father-in-law. His death was greatly lamented by his companions, who, in the excess of their grief, were changed into birds resembling swans. Altars were raised to Diomedes, as to a god, one of which Strabo mentions at Timavus. (*Virg. Ovid.* &c.) 2. A king of Thrace, son of Mars and Cyrene, who fed his horses with human flesh. It was one of the labours of Hercules to destroy them, and accordingly the hero, attended with some of his friends, attacked Diomedes, and gave him to be devoured by his own horses which he had fed so barbarously.

DION, in biography, a Syracusan, son of Hipparinus, famous for his power and abilities. He was related to Dionysius, and often advised him, together with the philosopher Plato, to lay aside the supreme power. His great popularity rendered him odious in the eyes of the tyrant, who banished him to Greece. There he collected a numerous force, and resolved to free his country from tyranny. This he easily effected on account of his uncommon popularity. He entered the port of Syracuse only in two ships, and in three days reduced an empire, which had already subsisted for fifty years, and which was guarded by 500 ships of war, and 100,000 foot, and 10,000 horse. The tyrant fled to Corinth, and Dion kept the power in his own hands, fearful of the aspiring ambition of some of the friends of Dionysius. He was shamefully murdered by one of his familiar friends, called Callicrates, or Callipus, 354 years before the Christian era, in the 55th year of his age, and 4 years after his return from Peloponnesus. His death was universally lamented by the Syracusans, who raised a monument to his memory.

DIONÆA. Venus's fly-trap. In botany, a genus of the class decandria, order monogynia. Calyx five-leaved; petals five; capsule one-celled, gibbous, many-seeded. One species only; d. muscipula; a native of Carolina, and in many respects a very extraordinary vegetable. Scape naked; leaves radical, roundish, two-lobed, fringed with stiff bristles, and so irritable as to fold together like a rat-trap, and crush insects which crawl or settle on them; petioles winged and not fringed; corymb terminal, peduncle one-flowered. The upper surface of the lobes of the leaves are covered with a great number of small red glands; each of which resembles, when highly magnified, a compressed arbutus-berry. Insects are often attracted by the appearance or perhaps the sweet secretion of these glands, but the moment they touch them, the two lobes rise up, grasp them fast, lock the two rows of spines together, and squeeze them to death. Nor do the lobes ever open again while the insect remains there. Other substances, however, as a needle, or piece of straw, excite the same irritable power as insects. We have here therefore the power of a pair of muscles existing without the fibres; and acting with a force superior to many animal sphincters. If the foreign substance can be pushed out so as not to strain the lobes, they will expand again; but if force be employed, so strong is the spring of their fibres, that one of the lobes will generally snap off rather than yield. The stalk is about six feet high, and the flowers are milk white. They require much attention to the degree of heat and exposure to air which may seem best to agree with the plant; and, after all, we are seldom able to ripen the seeds in the gardens of our own country.

DIONYSIA, in Grecian antiquity, solemnities in honour of Bacchus; sometimes called Orgia: and by the Romans Bacchanalia, and Liberalia.

DIONYSIACA, in antiquity, a designation given to plays and other stage amusements.

DIONYSIUS I. or the elder, was son of Hermocrates. He signalized himself in the wars which the Syracusans carried on against the Carthaginians, and taking advantage of the power lodged in his hands, he made himself absolute at Syracuse. To strengthen himself in his usurpation, and acquire popularity, he increased the pay of his soldiers, and recalled those that had been banished. He vowed eternal enmity against Carthage, and experienced various successes in his wars against that republic. He was highly ambitious of being thought a poet, and he set higher value on a prize adjudged to a composition of his at Athens, than all the victories he had obtained. His tyranny and cruelty at home rendered him odious in the eyes of his subjects, and he became so suspicious that he never admitted his wife or children to his private apartments without a previous examination of their garments. He never trusted his head to a barber, but always burnt his beard. He made a subterranean cave in a rock, said to be still extant, in the form of a human ear, in order to hear whatever was said by those whom his suspicion and cruelty had confined in the apartments above, and then put the artists to death lest they should disclose the purpose for which it was constructed. His impiety and sacrilege were as conspicuous as his suspicious credulity. He died, as some say, of an indigestion, in the 63d year of his age, B.C. 366, after a reign of 38 years. Others are of opinion that he died a violent death. The invention of the catapulta is attributed to him. (*Diod. Justin.* &c.) The second of that name, sirnamed the younger, was son of Dionysius the First by Doris. He succeeded his father as tyrant of Sicily, and by the advice of Dion, his brother-in-law, he invited the philosopher Plato to his court, under whom he studied for a while. The philosopher advised him to lay aside the supreme power, and in his admonitions he was warmly seconded by Dion, who afterwards expelled the tyrant from Syracuse, B.C. 357. Dionysius retired to Locri, and recovered Syracuse ten years after his expulsion. His triumph was short. The Corinthians, under the conduct of Timoleon, obliged him to retire from the city. He fled to Corinth; where to support himself, he kept a school, as Cicero observes, that he might still continue to be tyrant; and, as he could not command over men, he might still continue his power over boys. It is said that he died from an excess of joy when he heard that a tragedy of his own composition had been rewarded with a poetical prize. Dionysius was as cruel as his father, but he did not, like him, possess the art of retaining his power.*

DIONYSIUS (Halicarnassensis), an historian and critic of Halicarnessus, in Caria, who came to Rome about 30 years B.C. and there wrote his Roman Antiquities, or a History of Rome, upon which he was employed 24 years. Only eleven books, out of twenty, are now extant. He is a very faithful historian, and remarkably exact in his chronology. Besides his Antiquities, we have some other writings by Dionysius, the most esteemed of which is, De Structura Orationes. The best edition of all his works is that of Oxford, in 1704, 2 vols. folio.

DIONYSIUS (Periegetes), a poet and geographer, who was sent by Augustus to survey the eastern part of the world. This is the account given by Pliny the elder, but critics differ as to the Augustus here meant, though the most respectable understand him to be the first Augustus Cæsar. His Periegesis, or Survey of the World, is the only piece of his extant. It is in Greek hexameters, and was printed by Henry Stephens, 4to. 1577, and at Oxford in 1697.

DIOPHANTINE PROBLEMS, in algebra, certain questions relating to square and cubic numbers, right angled triangles, &c. the nature of which was first discussed by Diophantus in his Algebra.

In these questions, it is chiefly intended to find commensurable numbers to answer indeterminate problems; which often bring out an infinite number of incommensurable quantities. For example, let it be proposed to find a right-angled triangle, whose three sides x, y, z, are expressed by rational numbers; from the nature of the figure it is known that $x^2+y^2=z^2$, where z denotes the hypothenuse. It is plain that x and y may also be so taken, that z shall be irrational; for if $x=1$, and $y=2$, then is $z=\surd 5$. Now the art of resolving such problems consists in ordering the unknown quantity or quantities, in such a manner, that the square or higher power may vanish out of the equation, and then by means of the unknown quantity in its first dimension, the equation may be resolved without having recourse to incommensurables.

This kind of problems is well handled by many authors; but particularly by Fermat, de Billy, Ozanam, Kersey, Saunderson, and Euler. Professor Leslie of Edinburgh has an ingenious paper on diophantine algebra and indeterminate problems, in the 2d. vol. of the Edinburgh Philosophical Transactions, where, by means of a simple principle of very extensive application, he solves various problems falling under these classes.

Let $A\times B$ be any compound quantity equal to another $C\times D$, and let m be any rational number assumed at pleasure; it is manifest that, taking equimultiples, $A\times mB=C\times mD$. If, therefore, we suppose that $A=mD$, it must follow that $mB=C$, or $B=C\div m$. Thus, two equations of a lower dimension are obtained. If these be capable of a farther decomposition, we may assume the multiples n and p, and form four equations, still more simple. By the repeated application of this principle, an higher equation, if it admits of divisors, will be resolved into those of the first order, the number of which will be one greater than that of the multiples assumed. Hence the number of simple equations into which a compound expression can be resolved, is equal to the sum of the exponents of the unknown quantities in the highest term. Wherefore a problem can be solved by the application of this principle only, when the aggregate sum, formed by the addition of the exponents in the highest terms of the several equations proposed, is at least equal to the number of the unknown quantities, together with that of the assumed multiples.

Let it be required to find two numbers, the sum of the squares of which shall be equal to the sum of two given squares.

By hypothesis, $x^2+y^2=a^2+b^2$; and transposing, $x^2-a^2=b^2-y^2$; and by resolving into factors, $(x+a)\ (x-a)=(b+y)\ (b-y)$; whence, by substitution, $x+a=mb-my$, and $x-a=(b+y)\div m$. Transposing a in the first equation, gives $x=mb-my-a$; reducing the second, $mx-ma=b+y$; and transposing, $mx=ma+b+y$: whence $(ma+b+y)\div m=mb-my-a$; and $ma+b+y=m^2b-m^2y-ma$; then transposing, $m^2y+y=m^2b-2ma-b$; that is $y=(m^2b-2ma-b)\div(m^2+1)$. But, $x=mb-my-a$; whence, by substitution, $x=(m^2a+2mb-a)\div(m^2-1)$. Thus, if $x=5$, and $b=10$, and $m=2$: then $y=(4\cdot 10-4\cdot 5-10)\div 5=2$, and $x=(4\cdot 5+4\cdot 10-5)\div 5=11$: But $11^2+2^2=125=10^2+5^2$.

Corol. If $b=o$, we shall obtain two squares, the sum of which shall be a given square: for $y=-2ma\div(m^2+1)$, or $+2ma\div(m2+1)$, and $x=(m^2a-a)\div(m^2+1)$. Thus, if $a=10$, and $m=2$, then $y=4\cdot 10\div 5=8$, and $x=(4\cdot 10-10)\div 5=6$: but $8^2+6^2=100=10^2$.

Again, to find a cube which shall be equal to the product of a square by a given number.

By hypothesis, $x^3=ay^2$, and, resolving, $x\times x^2=a\times y^2$; whence $x=ma$, and $y^2=mx^2$: but $x^2=(ma)^2$, consequently $y^2=m^3a^2$, and $y\times y=ma\times m^2a$: and, by a second assumption, $y=pma$, and $m^2a=py$. But $x=ma$; whence $y=px$, and since $y=m^2a\div p$, $y=x^2\div ap$; wherefore $x^2\div ap=px$, and $x=ap^2$; but $y=px$, whence $y=ap^3$.

Suppose $a=3$, and $p=2$; then $x=3\times 2^2=12$, and $y=3=2^3=24$. For, $12^3=1728=3\times(24)^2$.

For the solution of various other problems, agreeably to this simple method, the reader may consult Mr. Leslie's memoir referred to above.

Diophantine algebra has generally been thought far more curious than useful: but it has been lately shewn, that it is capable of being employed with success in the calculation of fluents, one of the most important parts of the modern analysis. See an ingenious paper on this subject, by Mr. Cunliffe, in the Math. Repository, vol. ii. p. 394.

DIOPHANTUS, a celebrated mathematician of Alexandria, has been reputed to be the inventor of algebra; at least his is the earliest work extant on that science. It is not certain when Diophantus lived. Some have placed him before Christ, and some after, in the reigns of Nero and the Antonines; but all with equal uncertainty. It seems he is the same Diophantus who wrote the Canon Astronomicus, which Suidas says was commented on by the celebrated Hypatia, daughter of Theon of Alexandria. His reputation must have been very high among the ancients, since they ranked him with Pythagoras and Euclid in mathematical learning. Bachet, in his notes upon the 5th book De Arithmeticis, has collected, from Diophantus's epitaph in the Anthologia, the following circumstances of his life; namely, that he was married when he was 33 years old, and had a son born five years after; that this son died when he was 42 years of age, and that his father did not survive him above four years; from which it appears that Diophantus was 84 years old when he died.

DIOPSIDE. See DIOPSIDUM.

DIOPSIDUM; DIOPSIDE; in mineralogy, a genus of the class earth, order siliceous. Specific gravity is 3·2374; does not scratch glass, or very slightly; but scratches fluate of lime. Before the blow-pipe fuses into a glass of the same greenish colour as the mass itself. Its primitive form is a right-angled quadrangular prism, with oblique bases; the angle of incidence between the diagonal and the edge is 107° 8′. The prism is subdivisible by very clean sections in the direction of the diagonals of its bases. The divisions parallel to the bases are in general very clean; those that answer to the sides are less easy to obtain. Two species.

1. D. mussitum, mussite: of which there are five varieties, from a variety in the compactness of its structure, or in the form of its pyramids. Found in the commune of la Balmede-Mussa, in the department of the Po, toward the north of the valley of Lans, in the interstices of a vein one or two yards thick, that traverses, at the height of four or five yards, a rock called the Black Rock, which is twelve or fifteen yards high. The crystals have sometimes a translucid granular carbonate of lime for their gangue.

2. D. alalitum, alalite: discovered in a vein in the mountain of Ciarmetta, situate beyond that of Testa-Ciarva, at the Alp of la Mussa, near the village of Ala. It is commonly accompanied with green or pale yellow primitive garnets, and emarginated garnets of a hyacinth red, which have nothing in common with the topaz. It was these last that Mr. Bonvosin designated by the name of topazolites, because he thought them of a pleasing colour, which he compared with the yellow of the topaz.

The colours of the diopside are green, greenish gray, greenish white, and yellowish white. It is sometimes translucid, sometimes opake.

The crystals of mussite are small, elongated, and commonly opake. Several are twisted, and exhibit the primitive form very undecidedly. The crystals of alalite are in general larger, translucid, and of a greenish white.

DIOPSIS, in zoology, a genus of the class insecta, order deptera. Head with two inarticulate filiform horns much longer than the head, at the top of which are placed the eyes. One species. Inhabits South America and Guinea, and resembles an ichneumon. See Nat. Hist. Pl. LXXII.

DIOPTRATE, a term in natural history, applied to the orellate spots of the wings of insects, where the pupil is divided by a transverse line.

DIOPTRICS (from δια, *per, through*, and οπτομαι, *I see*,) or ANACLASTICS, the doctrine of refracted vision. The office of this branch of optics is to consider and explain the effects of light refracted by passing through different mediums, as air, water, glass, &c. and especially lenses.

Dioptrics is one of the most useful and pleasant of the human sciences; bringing the remotest objects near hand, enlarging the smallest objects so as to shew their minute parts, and even giving sight to the blind; and all this by the simple means of the attractive power in glass and water, causing the rays of light in their passage through them to alter their course according to the different substances of the medium; whence it happens, that the objects seen through them do, in appearance, alter their magnitude, distance, and situation.

The ancients have treated of direct and reflected vision; but what we have of refracted vision is very imperfect. J. Baptista Porta wrote a treatise on refraction, in 9 books, but without any great improvement. Kepler was the first who succeeded in any great degree, on this subject; having demonstrated the properties of spherical lenses very accurately, in a treatise first published anno 1611. After Kepler, Galileo gave somewhat of this doctrine in his Letters; as also an Examination of the Preface of Johannes Pena upon Euclid's Optics, concerning the use of optics in astronomy. Des Cartes also wrote a treatise on Dioptrics, commonly annexed to his Principles of Philosophy, which is one of his best works: in which the true manner of vision is more distinctly explained than by any former writer, and in which is contained the true law of refraction, which was found out by Snell, though the name of the inventor is suppressed: here are also laid down the properties of elliptical and hyperbolical lenses, with the practice of grinding glasses. Dr. Barrow has treated on dioptrics in a very elegant manner, though rather too briefly, in his Optical Lectures, read at Cambridge. There are also Huygens's Dioptrics, an excellent work of its kind. Molyneux's Dioptrics, a work rather heavy and dull. Hartsoeker's Essai de Dioptrique. Cherubin's Dioptrique Oculaire, et Da Vision Parfaite. David Gregory's Elements of Dioptrics. Traber's Nervus Opticus. Zahn's Oculus Artificialis Teledioptricus. Dr. Smith's Optics, a complete work of its kind. Wolfius's Dioptrics, contained in his Elementa Matheseos Universalis. Harris's Optics, Bouguer's Optics, and the 2d volume of Haüy's Natural Philosophy, may also be advantageously consulted. The Treatise on Optics, and the Optical Lectures of Newton, contain an account of experiments and reasonings, of inestimable value, in this branch of science: and Dollond's discovery of achromatic glasses, by which colours are obviated in refracting telescopes, is of especial importance.

The following may be laid down as the principal definitions. 1. When a ray of light passing out of one medium into another of a different density, is turned from that straight line in which it would otherwise proceed into one of a different direction, it is said to be refracted. Thus the rays AB, AC, &c. Pl. 57. fig. 3. by passing out of air into the glass BGC, are turned from their natural course into that of BF, CF, &c. and are therefore said to be refracted by the lens BGC. 2. Any spherical transparent glass, that converges or diverges the rays of light as they pass through it, is called a *lens*. 3. Of lenses there are five sorts: 1, A plane or single convex lens, which is plane on one side and convex on the other; as AZ, fig. 4. 2. A double convex lens, as B. 3. A plano-concave lens, that is, plane on one side and concave on the other, as C. 4. A double concave, as D. And, 5. A meniscus, which is convex on one side and concave on the other, as E. 4. The point C, round which the spherical surface of a lens, as AZ, is described, is called its *centre*; the line XY, drawn from that centre perpendicular to its two surfaces, is the axis; and the point V, to which the axis is drawn, is the vertex of that lens. 5. When the rays of light that pass through a single or double convex lens are brought into their smallest compass, that point is the focus of the lens. 6. In optical instruments, that lens which is next the object is called the *object-glass*; and that next the eye, the *eye-glass*. 7. The angle ABE between the ray AB fig 5, Pl. 57, and the perpendicular BE to the refracting surface, is called the *angle of incidence*: and the angle DBF between the refracted ray and the same perpendicular, the *angle of refraction*.

The chief propositions in the doctrine of dioptrics are these: 1. A ray of light passing obliquely out of one medium into another that is denser, will be refracted toward the perpendicular; as the ray AB, by passing out of air into glass, is refracted into BD, inclined to the perpendicular EF. On the contrary, a ray passing out of a denser into a rarer medium, will be refracted from the perpendicular; as the ray BD, passing out of the glass GH into air, is refracted into DI. 2. The sines of the angles of incidence and refraction, when the lines that contain them are all equal, will have a determinate proportion to each other, in the same mediums: which between air and water will be as 4 to 3; between air and glass, as 3 to 2, nearly; and in other mediums in proportion to their densities. 3. Any object viewed through a glass, whose two surfaces are parallel, will appear of its natural shape and dimensions, provided it be only of the size of the pupil of the eye, and the light proceeding from it be received directly through the glass by one eye only. In all other situations an alteration will be perceived not only in its apparent situation, but its dimensions also. This alteration will be greater in proportion to the thickness of the glass, and the obliquity of the rays; in general, it is so small as to be overlooked. 4. All the rays of light which fall upon a convex lens, whether parallel, converging, or diverging to a certain degree, will be made to meet in a focus on the other side; but if they diverge excessively, they will not do so. Thus if rays diverge from a point placed before the glass, at the focal distance from it, they will become parallel after passing through it; and if the point from which they proceed be nearer the glass than its focal distance, they will still continue to diverge, though in a less degree than before. 5. When parallel rays fall upon a concave lens, they will be made to diverge after passing through it. If they are diverging already before they fall upon the glass, they will diverge more after passing through it; or even if they are converging to a certain degree, they will diverge upon passing through a concave lens; but if the convergence is very great, they will converge after passing through the glass, though to a more distant point than that at which they would otherwise have met. 6. When an object is viewed through two convex lenses, its apparent diameter ought to be to its real one as the distance of the focus of the object-glass is to that of the eye-glass; but by reason of the aberration of the rays of light, the magnifying power will be somewhat greater or less in proportion to the diameter of the object. By these we are enabled to account for the various effects of dioptric machines, as refracting telescopes, microscopes, the camera obscura, &c. See the articles LENS, MIRROR, REFRACTION, CAMERA OBSCURA, TELESCOPE, &c.

The principal dioptric problem is that of finding the focus of any sort of lens exposed either to converging, diverging, or parallel rays of light, proceeding from, or tending to a given point, in the axis of the lens, be the ratio of refraction what it will, according to the nature of the transparent material the lens is formed of, and also with allowance for the thickness of the lens between the vertices of the two spherical segments. This problem being solved in one case, mutatis mutandis, will exhibit theorems for all the possible cases, whether the lens be double-convex or double-concave, plano-convex or plano-concave, or a meniscus. But this is only to be understood of those rays which are nearest to the axis of the lens, so as to occasion no sensible difference by their inclination to it; and the focus here formed is by dioptric writers commonly called the principal focus, being that of use in telescopes and microscopes.

Let then, in fig. 6, Pl. 57, BEb be a double convex lens, C the centre of the segment EB, and K the centre of the segment Eb, Bb the thickness of the lens, D a point in the axis of the lens; and it is required to find the point F, where the beams, proceeding from the point D, are collected, the ratio of refraction being as m to n. Let the distance of the object DB=DA=d, (the point A being supposed the same with B, but taken at a distance from it to prevent the coincidence of so many lines,) the radius of the segment towards the object CB or CA=r, and the radius of the segment from the object Kb or Ka =ϱ, and let Bb the thickness of the lens be=t; then let the sine of the angle of incidence DAG be to the sine of the refracted angle HAG, or CAf, as m to n; and in very small angles the angles themselves will be in the same proportion. Whence it will follow that, as d to r, so the angle at C to the angle at D, and hence $d+r$ will be as the angle of incidence GAD: again, as m to n, so $d+r$ to $\frac{dn+rn}{m}$, which will be as the angle GAH=CAf; this being taken from ACD, which is as d, will leave $\frac{\overline{m-n}.\,d.-nr}{m}$ analogous to the angle AfD; and the sides being in this case proportional to the angles they subtend, it will follow, that as the angle AfD is to the angle ADf, so is the side AD or BD, to Af or Bf: that is, Bf will be $=\frac{mdr}{\overline{m-n}.d-nr}$, which shows in what point the beams proceeding from D would be collected by means of the first refraction. But if nr cannot be subtracted from $\overline{m-n}.d$, it follows that the beams after refraction do still pass on diverging, and the point f is on the same side of the lens beyond D: or if nr be equal to $\overline{m-n}.d$, then they proceed parallel to the axis, and the point f is infinitely distant.

The point f being found as before, and Bf—Bb being given, which we call δ; it follows, by a process like the former, that bF, or the focal distance sought, is equal to $\frac{\delta\varrho n}{\overline{m-n}.\delta+m\varrho}=f$. And instead of b substituting $Bf - Bb = \frac{m\cdot r}{m-1.d-ar} - t$, putting p for $\frac{n}{m-n}$, after due reduction this following equation will arise, $\frac{mpdr\varrho - nd\varrho t + npr\varrho t}{mdr + md\varrho - mpr\varrho - \overline{m-n}.dt + nrt} = f$. Which theorem, however it may seem operose, is not so, considering the great number of data that enter the question, and that one half of the terms arise from our taking in the thickness of the lens, which in most cases can produce no great effect, however it was necessary to consider it, to make our rule perfect. If, therefore, the lens consist of glass, whose refraction is as 3 to 2, it will be $\frac{6dr\varrho - 2d\varrho t + 4r\varrho t}{3dr + 3d\varrho - 6r\varrho - dt + 2rt} = f$. If of water, whose refraction is as 4 to 3, the theorem will stand thus $\frac{12dr\varrho - 3d\varrho t + 9r\varrho t}{4dr + 4d\varrho - 12r\varrho - dt + 3rt} = f$. If it could be made of diamond, whose refraction is as 5 to 2, it would be $\frac{\frac{10}{3}dr\varrho - 2d\varrho t + 4r\varrho t}{5dr + 5d\varrho - \frac{10}{3}r\varrho - 3dt + 2rt} = f$. And this is the universal rule for the foci of double convex glasses exposed to diverging rays. But if the thickness of the lens be rejected as not sensible, the rule will be much shorter, viz. $\frac{pdr\varrho}{dr + d\varrho - pr\varrho} = f$, or in glass $\frac{2dr\varrho}{dr + d\varrho - 2r\varrho} = f$; all the terms wherein t is found being omitted, as equal to nothing. In this case, if d be so small, as that $2r\varrho$ exceed $dr + d\varrho$, then will it be $-f$, or the focus will be negative, which shows that the beams after both refractions still proceed diverging.

To bring this to the other cases, as of converging beams, or of concave glasses, the rule is ever composed of the same terms, only changing the signs of + and −; for the distance of the point of concourse of converging beams, from the point B, or the first surface of the lens, we call a negative distance or $-d$; and the radius of a concave lens we call a negative radius or $-r$, if it be the first surface, and $-\varrho$, if it be the second surface. Let then converging beams fall on a double convex of glass, and the theorem will stand thus $\frac{-2dr\varrho}{-dr - d\varrho - 2r\varrho} = +f$; which shows that in this case the focus is always affirmative.

If the lens were a meniscus of glass, exposed to diverging beams, the rule is $\frac{-2dr\varrho}{-dr + d\varrho + 2r\varrho} = f$; which is affirmative when $2r\varrho$ is less than $dr - d\varrho$, otherwise negative: but in the case of converging beams falling on the same meniscus, it will be $\frac{+2dr\varrho}{+dr - d\varrho + 2r\varrho} = f$; and it will be $+f$, while $d\varrho - dr$ is less than $2r\varrho$, but if it be greater than $2r\varrho$, it will always be found negative or $-f$. If the lens be double concave, the focus of converging beams is negative, where it was affirmative in the case of diverging beams on a double convex, viz. $\frac{-2dr\varrho}{+dr + d\varrho - 2r\varrho} = f$, which is affirmative only when $2r\varrho$ exceeds $dr + d\varrho$: but diverging beams passing a double concave have always a negative focus, viz. $\frac{-2dr\varrho}{+dr + d\varrho + 2r\varrho} = -f$.

The theorems for converging beams are principally of use to determine the focus resulting from any sort of lens placed in a telescope, between the focus of the object-glass and the glass itself; the distance between the said focus of the object-glass and the interposed lens being made $= -d$.

We here suppose the reader acquainted with the rules of analytical multiplication and division, as that + multiplied by + makes the product +, + by − makes −, and − by − makes +; so dividing + by + makes the quote +, + by − makes −, and − by − makes +; which will be necessary to be understood in the preceding examples.

In case the beams are parallel, as coming from an infinite distance, which is supposed in the case of telescopes; then will d be supposed infinite, and in the theorem $\frac{pd\varrho r}{dr + d\varrho - pr\varrho}$ the term $pr\varrho$ vanishes, as being finite, which is no part of the other infinite terms, and dividing the remainder by the infinite part d, the theorem will stand thus, $\frac{pr\varrho}{r + \varrho} = f$, or in glass, $\frac{2r\varrho}{r + \varrho} = f$.

In case the lens were plano-convex* exposed to diverging beams, instead of $\frac{pd\varrho r}{dr + d\varrho = pr\varrho}$, r being infinite, it will be $\frac{pd\varrho}{d - p\varrho} = f$, or $\frac{2d\varrho}{d - 2\varrho} = f$ if the lens be glass.

If the lens be double-convex, and r be equal to ϱ, as being formed of segments of equal spheres, then will $\frac{pd\varrho r}{dr + d\varrho - pr\varrho}$ be reduced to $\frac{pdr}{2d - pr} = f$; and in case d be infinite, then it will be yet farther contracted to $\frac{1}{2}pr$, and p being $= \frac{n}{m-n}$, the focal distance in glass will be $= r$, in water $1\frac{1}{2}r$, but in diamond $\frac{1}{3}r$.

This may suffice to show the extent of our theorem, and how easy a reduction adapts any one case to all the rest. Nor is this only useful to discover the focus from the other proposed data, but from the focus given, we may thereby determine the distance of the object, or from the focus and distance given, we may find of what sphere it is requisite to take another segment, to make any given segment of another sphere cast the beams from the distance d to the focus f; as likewise from the lens, focus, and distance given, to find the ratio of refraction, or of m to n, requisite to answer those data. All which, it is obvious, are fully determined from the equation we have hitherto used, viz. $pd\varrho r = drf + d\varrho f - pr\varrho f$; for to find d, the theorem is $\frac{pr\varrho f}{rf + \varrho f - p\varrho r} = d$, the distance of the object.

For ϱ, the rule is $\frac{drf}{pdr + df + prf} = \varrho$.

But for p, it is $\frac{drf + d\varrho f}{d\varrho r + f\varrho r} = p$, which latter determines the ratio of refraction, m being to n as $1 + p$ to p.

We shall not expatiate on these particulars, but leave them for the exercise of those who are desirous to be informed in optical matters, which are comprehended in these three rules, as fully as the most inquisitive can desire them, and in all possible cases; regard being had to the signs + and −, as in the former cases of finding the focus. We shall only show two considerable uses of them; the one to find the distance whereat an object being placed, it shall by a given lens be represented in a species as large as the object itself, which may be of singular use in drawing faces, and other things in their true magnitude, by transmitting the species by a glass into a dark room, which will not only give the true figure and shades, but even the colours themselves, almost as vivid as the life. In this case d is equal to f, and substituting d for f in the equation, we shall have $pdr\varrho = ddr + dd\varrho - dp\varrho r$, and dividing all by d, then $pr\varrho = dr + d\varrho - pr\varrho$, that is $\frac{2pr\varrho}{r+\varrho}=d$; but if the two convexities be of the same sphere, so as $r=\varrho$, then will the distance be $=pr$; that is, if the lens be glass $=2r$; so that if an object be placed at the diameter of the sphere distant, in this case the focus will be as far within as the object is without, and the species represented will be as large as the life; but if it were a plano-convex, the same distance will be $=2pr$, or in glass equal to 4 times the radius of the convexity.

A second use is to find what convexity or concavity is required, to make a vastly distant object be represented at a given focus, after the one surface of the lens is formed; which is but a corollary of our theorem for finding ϱ, having p, d, r and f given; for d being infinite, that rule becomes $\frac{rf}{pr-f}=\varrho$, that is in glass $\frac{rf}{2r-f}=\varrho$; whence, if f be greater than $2r$, ϱ becomes negative, and $\frac{rf}{f-2r}$ is the radius of the concave sought.

But to return to our first theorem, which accounting for the thickness of the lens, we will here again resume, viz.
$\frac{mpdr\varrho - nd\varrho t + npr\varrho t}{mdr + md\varrho - mpr\varrho - \overline{m-n}.dt + nrt}=f$. And let it be required to find the focus, where a whole sphere will collect the beams proceeding from an object at the distance d: here t is equal to $2r$, and $r=\varrho$: and, after due reduction, the theorem will stand thus, $\frac{mpdr - 2ndr + 2nprr}{2nd + 2nr - mpr}=f$, but if d be infinite, it is contracted to $\frac{mpr}{2n}-r=\frac{2n-m}{2m-2n}r=f$; wherefore a sphere of glass collects the sun's beams at half the semidiameter of the sphere without it, and a sphere of water at a whole semidiameter. But if the ratio of refraction m to n, be as 2 to 1, the focus falls on the opposite surface of the sphere, and if it be of greater inequality it falls within.

Another example shall be, when a hemisphere is exposed to parallel rays, that is d and ϱ being infinite, and $t=r$; then after due reduction the theorem results $\frac{nn}{mm-mn}r=f$. That is, in glass it is at $\frac{4}{3}r$, in water at $\frac{9}{4}r$; but if the hemisphere were diamond, it would collect the beams at $\frac{4}{15}$ of the radius beyond the centre.

Lastly, as to the effect of turning the two sides of a lens towards an object; it is evident, that if the thickness of the lens be very small, so as that you neglect it, or account $t=0$; then in all cases the focus of the same lens, to whatever beams, will be the same, without any difference on the turning the lens: but if you are so nice as to consider the thickness, (which is seldom worth accounting for) in the case of parallel rays falling on a plano-convex of glass, if the plain side be towards the object, t occasions no difference, but the focal distance $f=2r$: but when the convex side is towards the object, it is contracted to $2r-\frac{2}{3}t$, so that the focus is nearer by $\frac{2}{3}t$. If the lens be double convex, the difference is less; if a meniscus, greater. If the convexity on both sides be equal, the focal length is about $\frac{1}{6}t$ shorter than when $t=0$. In a meniscus, the concave side towards the object increases the focal length, but the convex towards the object diminishes it. A general rule for the difference arising on turning the lens, where the focus is affirmative, is this, $\frac{2rt-2\varrho t}{3r+3\varrho-t}$, for double convexes of differing spheres. But for a meniscus, the same difference becomes $\frac{2rt+2\varrho t}{3r-3\varrho+t}$; of which we need give no other demonstration, but that by a due reduction it will so follow from what is premised, as will the theorems for all sorts of problems relating to the foci of optic glasses.

DIOPTRIC. *a.* Relating to dioptrics.

DIOPTRIC TELESCOPE. See TELESCOPE.

DIORTHROSIS. *s.* (διορθρωσις.) An operation by which crooked or distorted members are restored to their regular shape (*Harris*).

DIOSCOREA. In botany, a genus of the class diœcia, order hexandria. Calyx six-parted; corolless. Fem. styles three; capsule three-celled, compressed; seeds two, membranaceous. Fifteen species, all Indian plants; of which the only one particularly worthy of notice is

D. sativa. Common yam, with heart-shaped, alternate leaves; round, wingless stem. It is a creeping plant: its stalks trailing on the ground to a considerable distance, and putting out roots from their joints, by which it becomes very considerably multiplied. The roots are used as an esculent in both Indies; and is the common food of the slaves in the West Indies. The plant is propagated exactly as we propagate potatoes in this country, by cutting the roots in pieces and preserving an eye in each piece; the common proportion of roots is three or four to every plant. The skin of the root is thick, rough and unequal, covered with many strong fibres or filaments, and of a violet colour, approaching to black. In the inside it partakes of the consistency of the red beet, but in colour is white, and in mealiness it resembles the potatoe. If kept from moisture the roots may be preserved many years without deterioration. The common weight of a root is two or three pounds, though they have sometimes been known to weigh upwards of twenty. In our own gardens the yam-plant can only be cultivated in a hot-house. There is great variety in the colour, size, and shape of yams; they are generally blue or brown, round or oblong. They are esteemed when dressed, as being nutritious and easy of digestion, and are preferred to wheaten bread. Their taste is somewhat like the potatoe, but more luscious. The negroes, whose common food is yams, boil and mash them. They are also ground into flour, and made into bread and puddings. When they are to be kept for some time, they are exposed upon the ground to the sun as we do onions, and when sufficiently withered they are put into dry sand in casks, and placed in a dry garret, where they remain often for many seasons without losing any of their primitive goodness.

DIOSCURIA, (διοσκουρια, *sons of Jupiter*), in antiquity, a festival observed by the Cyreneans and Spartans, in honour of Castor and Pollux. The solemnity was full of mirth, and attended with lively sports.

DIO'SMA, in botany, a genus of the class pentandria, order monogynia. Corol five petalled, nectaries five, above the germ; capsules three or five, united; seeds veiled. Thirty-one species, all Cape-plants, of which the following are the most esteemed, and in culture among ourselves.

1. D. oppositifolia, or cross-leaved diosma. It rises to the height of three or four feet, the branches are slender and produced irregularly from the stem; the leaves are three-sided, obtuse, ciliate; the flowers are terminal.

2. D. hirsuta, with leaves three-sided, mucronate, rough-haired; flowers terminal, mostly solitary: a very handsome shrub, growing to the height of five or six feet; the stalks of which are of a fine coral colour; the whole plant, leaves, flowers and seeds, possesses an agreeable fragrance. Both species may be propagated by cuttings, which should be plunged into a moderate hot-bed during any part of the summer. In about two months the cuttings will take root, and should be then transplanted into small pots, in which they are to remain. But in the winter they require the shelter of the green-house.

DIOSPY'ROS. Date-palm: or Date-plum. In botany, a genus of the class polygamia, order diœcia. Calyx four-cleft; corol cup-shaped, four-cleft; stamens eight; style four-cleft; berry eight-celled; seeds solitary. Eight species; chiefly of the East Indies. The two following are the chief.

1. D. lotus; having the surface of its leaves of different colours. Found in Africa and Italy, and said to be the fruit referred to by Homer, in his account of the oblivion into which Ulysses and his companions were thrown by the fruit that was given for the purpose of enchanting them in this manner. Yet it does not seem to produce any such affection of the brain in modern days. In Italy, this plant is a tree of thirty feet high.

2. D. Virginiana. Pitchumen, Pishoman or Persimen-plum; with the surface of its leaves of the same colour. A native of Virginia, rising to twelve or fourteen feet, but generally dividing into many trunk branches near the ground. Both species may be cultivated from their seeds in our own gardens, though most successfully in our green-houses, or in moderate hot-beds; and if gradually inured to the climate when young plants, will be found sufficiently strong at length to endure all its variations.

DIOXIA, in music. See DIAPENTE.

To **DIP.** *v. a.* pret. *dipped*; part. *dipped* or *dipt.* (dippan, Saxon; *doopen*, Dutch.) 1. To immerge; to put into any liquor (*Ayl.*). 2. To moisten; to wet (*Milton*). 3. To be engaged in any affair (*Dryden*). 4. To engage as a pledge (*Dryden*).

To DIP. *v. n.* 1. To sink; to immerge (*L'Estrange*). 2. To enter; to pierce (*Granville*). 3. To enter slightly into any thing (*Pope*). 4. To take that which comes first; to choose by chance (*Dryden*).

DIP OF THE HORIZON. See DEPRESSION.

DIPETALOUS. (*dipetala.*) Corolla, or two-petalled; having two petals only: as circæa, commelina.

DIPHTHERA, a garment made of skins worn by the ancient shepherds and labourers.

DIPHTHONG. (διφθογγος.) In grammar, a double vowel, or the union, or mixture, of two vowels pronounced together, so as only to make one syllable: as 1. The Latin *ae*, or *æ*; *oe*, or *œ*. 2. The Greek *αι*, *ει*. 3. The English *ai*, *au*, &c. (See VOWEL, SYLLABLE, and GRAMMAR). The word is Greek, and is compounded of δις, twice; and φθογγος, sound.

The Latins pronounced the two vowels in their diphthongs much as we do, with this exception, that the two were not heard equally, but the one was somewhat weaker than the other; though the division was made with all the delicacy imaginable; among us most of the Latin diphthongs are lost in the pronunciation; their *æ* and *œ* are only spoken as *e's*; so also the English *ea*, *oa*, &c. though wrote with two characters, are pronounced as simple sounds. In English, French, and divers other languages, one may distinguish diphthongs with regard to the eye, from diphthongs with regard to the ear. A diphthong with regard to the eye, is formed of two vowels, meeting in the same syllable, whether the particular sound of each of them be heard in the pronunciation, or whether the sound of one of them be drowned; or, lastly, whether a new sound, different from either of them, result from both. In the two latter cases, it is with some impropriety that we call them diphthongs: the first only are real diphthongs, as being such both to the eye and ear. Diphthongs with regard to the ear, are either formed of two vowels, meeting in the same syllable, whose sounds are severally heard; or of three vowels, in the same syllable, which only afford two sounds in the pronunciation. On this last occasion, diphthongs with regard to the ear, are triphthongs with regard to the eye.

DIPHYLLOUS. (δις, and φυλλον, a leaf.) In botany, a two-leaved calyx: as in papaver and fumaria. Applied also to the cirrus or tendril, as in lathyrus; and to the peduncle, as in gomphrena.

DIPHYSA, in botany, a genus of the class diadelphia, order decandria. Calyx five-cleft, unequal; legume one-celled, many-seeded; compressed; surrounded on each side with a large, inflated, longitudinal bladder. One species; a native shrub of Carthagena, with pinnate leaves; leaflets oblong, emarginate; peduncles axillary, two or three-flowered; flowers yellow.

DIPLA'ZIUM, in botany, a genus of the class cryptogamia, order filices. Fructification in scattered, double decussate lines, near the vein of the frond; involucres double, originating from a vein opening towards the margin on both sides. Two species, both exotics.

DI'PLOE. (*diploe*, from διπλοω, to double.) In anatomy. Meditullium. The spongy substance between the two tables of the skull.

DIPLOMA (διπλωμα, from διπλοω, to fold, or double up), was originally a letter or writing of a sovereign conferring a title or dignity, or granting some immunity or privilege. The oldest is that of the emperor Galba dismissing some veteran soldiers. These instruments were originally written on waxed tables folded together; whence their name.

Latterly, the term diploma is restricted to the instrument by which a legalized incorporation, as a university or college, confers a title of dignity, or a privilege to practise in a learned profession.

DIPLOMACY, is the knowledge of the relations of independent states to each other. This knowledge is supposed to be best understood by those who are authorised by sovereigns (formerly by diploma) to be ambassadors from the government of one state to that of another.

DIPLOMATICS, the science of diplomas, or of ancient literary monuments, public documents, &c. It does not, however, nor can it, absolutely extend its researches to antiquity; but is chiefly confined to the middle age, and the first centuries of modern times. For though the ancients were accustomed to reduce their contracts and treaties into writing; yet they graved them on tables, or covered them over with wax, or brass, copper, stone, or wood, &c. And all that in the first ages were not traced on brass or marble, have perished by the length of time, and the number of destructive events. The word diploma signifies, properly, a letter or epistle, that is folded in the middle, and that is not open. But, in more modern times, the title has been given to all ancient epistles, letters, literary monuments, and public documents, and to all those pieces of writing which the ancients called syngrapha, chirographa, codicilli, &c. In the middle age, and in the diplomas themselves, these writings are called litteræ, præcepta, placita, chartæ indiculæ, sigilla, and bullæ; as also panchartæ, pantochartæ, tractoriæ, descriptiones, &c. The originals of these pieces are named exemplaria, or autographa, chartæ authenticæ, originalia, &c. and the copies, apographa, copiæ, particulæ, and so forth. The collections that have been made of them, are called chartaria and chartulia. The place where these papers and documents were kept the ancients named scrinia, tabularium, or ærarium; words that were derived from the tables of brass, and, according to the Greek idiom, archeium or archivum. On this subject there are two works which furnish the clearest lights on this matter, and which may serve as sure guides in the judgment we may have occasion to make on what are called ancient diplomas. The one is the celebrated Treatise on the Diplomatic, by F. Mabillon; and the other, the first volume of the Chronicon Gotvicense. We there find specimens of all the characters, the flourishes, and different methods of writing, of every age.

Diplomatics, is now more commonly used to denote that branch of knowledge which ought to be possessed by an ambassador to a foreign court. The art of diplomatics has been cultivated with great assiduity by every nation in Europe for many years past, and men experienced in political history, of engaging manners, and possessing a considerable share of general knowledge, and especially of international relationships, have always been selected by each to practise it. The principal aim of the *corps diplomatique* (as the French term ambassadors) is to discover the movements and intentions of their brethren, and to conceal their own.

DIPLO'PIA. (*diplopia*, διπλωπια, from διπλοος, double, and οπτομαι, to see.) Visus duplicatus. A defect of vision in which the person sees an object doubly or trebly. It is rather a symptom of a disease than a disease itself.

DI'PPER. *s.* (from *dip.*) One that dips in the water.

Dipper. In ornithology. See **Columbus.**

DIPPING, among miners, signifies the interruption, or breaking off, of the veins of ore; an accident that gives them a great deal of trouble before they can discover the ore again.

Dipping-needle, or **Inclinatory needle**, a magnetical needle, so hung, as that, instead of playing horizontally, and pointing out north and south, one end dips, or inclines to the horizon, and the other points to a certain degree or elevation above it.

The inventor of the dipping-needle was Robert Norman, a compass-maker at Ratcliffe, about the year 1580. This is not only testified by his own account, in his New Attractive, but also by Dr. Gilbert, Mr. William Burrowes, Mr. Henry Bond, and other writers of that time, or soon after it. The occasion of the discovery he himself relates, viz. that it being his custom to finish, and hang the needles of his compasses, before he touched them, he always found that, immediately after the touch, the north point would dip or decline downward, pointing in a direction under the horizon; so that, to balance the needle again, he was always forced to put a piece of wax on the south end, as a counterpoise. The constancy of this effect led him at length to observe the precise quantity of the dip, or to measure the greatest angle which the needle would make with the horizon. This, in the year 1576, he found at London was 71° 50′. It is not quite certain whether the dip varies, as well as the horizontal direction, in the same place. Mr. Graham made a great many experiments with the dipping-needle in 1723, and found the dip between 74 and 75 degrees. Mr. Nairne, in 1772, found it somewhat above 72°.

Mr. Whiston, whose needle there is reason to suppose was more to be relied upon than Norman's or Bond's, determined the dip in 1720, to be 75° 10′; this compared with Mr.

Cavendish's accurate observations in 1775, when he found the dip to be 72° 30′, makes the decrease in this period of 55 years, on a mean 2′·9 per annum. And from a comparison of Mr. Gilpin's observations of the dip in August 1805, when he found it 70° 20′, with those of Mr. Cavendish in 1775, its annual decrease on a mean, appears to have been 4′·3; and its progressive annual decrease, on a mean in the above-mentioned period of 30 years, to have been 1′·4.

It is certain, however, from many experiments and observations, that the dip is different in different latitudes, and that it increases in going northward. It appears from a table of observations made with a marine dipping-needle of Mr. Nairne's, in a voyage towards the north pole, in 1773, that

in latitude 60° 18′ the dip was 75° 0′,
in latitude 70 45 the dip was 77 52,
in latitude 80 12 the dip was 81 52, and
in latitude 80 27 the dip was 82 2½.

See Phipps's Voyage, p. 122. See also the Observations of Mr. Hutchins, made in Hudson's bay and straits, Philos. Trans. vol. 65, p. 129.

Burrowes, Gilbert, Ridley, Bond, &c. endeavoured to apply this discovery of the dip to the finding of the latitude; and Bond, going still farther, first of any proposed finding the longitude by it; but for want of observations and experiments, he could not go any length. Mr. Whiston, being furnished with the farther observations of colonel Windham, Dr. Halley, Mr. Pound, Mr. Cunningham, M. Noel, M. Feuille, and his own, made great improvements in the doctrine and use of the dipping-needle, brought it to more certain rules, and endeavoured in good earnest to find the longitude by it. But all the rules which have been hitherto proposed for this purpose have been gratuitous, uncertain, and unsatisfactory.

In order to determine the law that regulates the inclination or dip of the needle, Biot, in a Memoir delivered by himself and Humboldt to the French National Institute, On the Variations of the Terrestrial Magnetism in different Latitudes, supposed in the axis of the magnetic equator, and at equal distances from the centre of the earth, two centres of attractive forces, the one austral and the other boreal, so as to represent the two opposite magnetic poles of the earth; he then calculated the effect which ought to result from the action of these centres upon any point of the earth's surface, assuming the attractive force in the reciprocal ratio of the squares of the distances: he found that his results approximated more and more to the truth in proportion as the distance between the magnetic poles was assumed less; and, indeed, by supposing those two poles or centres to coincide, or the inclination of the magnetic needle to be produced by an indefinitely small magnet placed in the centre of the earth, his theorem gave the same numbers as had been observed by Humboldt both in Europe and in America, as well as what had been observed in Russia, Lapland, and various other places in both hemispheres: the results of theory being classed with those of observations in a comparative table, which clearly evinces their near coincidence. Let u be the angle included between a radius drawn from the earth's centre to any assumed point on its surface and the magnetic axis, β the angle comprehended between the line coinciding with the real position of the needle and the said magnetic axis, and I the inclination of the needle with the horizon of the place; then we have

$$\text{I.} \qquad \text{tan.}\ \beta = \frac{\text{sin.}\ 2u}{\text{cos.}\ 2u + 1}:$$

whence β is readily determined; and then we shall have the inclination by means of the following:

$$\text{II.} \qquad I = 90° + u - \beta.$$

Still it must be observed, that though these formulæ given by Biot, furnished in general results very near the truth: yet when he attempted to represent the inclinations in different latitudes by the supposition of a magnet infinitely small, very near the centre of the earth and perpendicular to the magnetic equator, he did not pretend to consider the hypothesis as any thing real, but solely as a mathematical abstraction useful in connecting the results, and tending to ascertain in future whether any changes exist.

DI'PSACUS. Teazel. In botany, a genus of the class tetrandria, order monogynia. Common calyx many-leaved; proper superior one-leafed; receptacle chaffy; crown of the seed cup-shaped. Four species; of which two are common to the hedges, and one to the moist wastes of our own country. The only species we need notice is d. fullonum, which is still cultivated in the west of England, as being, at least till lately, of general use in raising the knap upon woollen cloths, but which for some years has been gradually sinking into disuse.

DIPSAS, in zoology, the green coluber.

DIPTERA, in zoology, an order of the class insecta, characterised by having two wings, under each of which is a clavate poise with its appropriate scale. Of these some possess both proboscis and sucker; others have a sucker, but no proboscis. See ENTOMOLOGY and ZOOLOGY.

DIPTERE, in ancient architecture, a temple surrounded by a double row of columns, forming wings.

DI'PTERIX, in botany, a genus of the class diadelphia, order decandria. Calyx with the two upper divisions wing-shaped; legume one-celled, one-seeded, coriaceous, two-valved. Two species; both natives of South America, and both trees sixty feet high.

1. D. odorata, called by the inhabitants tonca bean, with alternate leaves and terminal racemes: legume fleshy, and yellowish; seed highly fragrant, covered with a thin brittle shell.

2. D. oppositifolia: leaves opposite; flowers panicled; legume coriaceous, greenish.

DI'PTOTE. *s.* (διπτωτα.) A noun consisting of two cases only (*Clarke*).

DIPTYCHA, in antiquity, a public register, wherein were written the names of the consuls, and other magistrates, among the heathens; and of bishops, and defunct as well as surviving brethren among the Christians. The word is formed from the Greek διπτυχων, or διπτυχα, and that from διπτυξ, a masculine noun derived from πτυσσω, I fold or plait. From its future ϖτυξω, is formed ϖτυξ, a fold or plait, to which adding δις, twice, we have διπτυξ, in the genitive διπτυχος, whence the nominative neuter διπτυχον, q. d. a book folded in two leaves; though there were some in three, and others in four or five leaves. An ingenious author imagines this name to have been first given them to distinguish them from the books that were rolled, called volumina.

DIPUS. Jerboa. In zoology, a genus of the class mammalia, order glires. Fore-teeth two in each jaw; fore-legs very short, hind-legs very long; tail long, tufted at the tip. These animals in their habits very much resemble dormice. By means of their long hind-legs they make prodigious bounds; and use the fore-paws to carry food to the mouth. The genus was probably known to the ancients under the name of μυς διπους, two-footed mouse, a figure that occurs on various coins of Cyrene, where the animal is still to be found. It is said by Bochart to be the שפן (saphan) of the Hebrew Scriptures, which in our common version is generally translated conies: see Ps. civ. 18. Prov. xxx. 26: but the characters ascribed to it in these passages do not apply very accurately either to the cony (rabbit) or jerboa: and Dr. Shaw and Mr. Bruce are probably right in referring the Hebrew saphan to another animal, which they denominate daman Israel.

There are ten species of the jerboa, of which the following are the chief.

1. D. jaculus. Alagtago, or common jerboa. Feet fore-toed; fore-feet with a claw, instead of the thumb; hind-legs three times as long as the fore, and used after the manner of the kanguroo; teats eight, and distant from each other; hair above pale-brown, beneath whitish; ears and feet flesh-coloured: body seven inches long; tail ten. Inhabits Egypt, Arabia, and South Siberia, in firm ground, and fields covered with herbage; is not easily tamed; rests with the hind-legs under the belly, and fore-legs near the throat, so as not easily to be seen: forms long winding burrows with a chamber at the end, half a yard below the surface of the soil; feeds on roots, grain, and grass; cuts grass, which, when dry, it carries into its retreats for winter provision. The flesh is eaten by the Calmucs and Arabians. See Nat. Hist. Plate LXXIII.

2. D. cafer. Cape jerboa. Toes five before, four behind: body above bright chesnut, beneath yellowish white; tail very hairy, black at the tip. Inhabits the Cape; is fourteen inches long, the tail fifteen, ears three; burrows with the fore-feet; sleeps sitting on its haunches, the head between the legs, and the fore-paws over the ears; is driven out of its hole by water poured in; grunts with a shrill voice, the flesh is eaten by the natives.

3. D. meridianus. Torrid jerboa. Fore-feet three-toed, with the rudiment of a fourth; hind feet five-toed; tail colour of the body, which is above pale tawny, sometimes greyish, beneath white. Inhabits the sandy deserts of the torrid region, near the Caspian sea: feeds on a few farinaceous seeds; forms burrows with three apertures, about a yard under the surface. Body five inches long; tail three inches.

4. D. tamaricinus. Tamarisk jerboa. Fore-feet three-toed, with the rudiment of a fourth; hind-feet five-toed; tail obscurely annulate, hairy, a little tufted at the tip. Body above yellowish-grey, beneath white. Inhabits the salt marshes of the Caspian sea; feeds on the fruit of the tamarisk, whence its specific name, and burrows under it with two entrances into its chamber. A very elegant animal; body five and a half inches long; tail the same length.

5. D. Canadensis. Canada jerboa. Toes four before, five behind; tail covered with bristles, longer than the body, the colour of which is ferruginous. Inhabits the coldest parts of Canada; size of a small mouse; frequents shrubby places; active; caught with difficulty.

DIPYRE, a species of siliceous earth, found at Manleon in the Pyrennees, imbedded in steatite. Colour greyish, or reddish-white, passing into pale rose colour. It occurs either disseminated in small fascicular masses, or in minute prismatic crystals. It has a brilliant vitreous lustre, a lamellar fracture, parallel to the sides of a regular hexahedron. It is moderately hard, easily frangible; and when pulverised and thrown on hot coals, gives a pale phosphoric light. It is fusible with ebullition before the blow-pipe, and yields, according to Vauquelin,

60	silex.
24	alumine.
10	lime.
2	water.
96	
4	loss.
100	

DIRÆ, in mythology. See FURIES.

DIREA, in botany, a genus of the class octandria, order monogynia. Calyxless; corol tubular, with the border obsolete; stamens longer than the tube; drupe one-seeded. One species; a Virginian shrub, with oval, pale, yellowish leaves; flowers axillary, two or three on each peduncle, greenish white.

DIRE. *a.* (*dirus*, Latin.) Dreadful; dismal; mournful; horrible; terrible (*Milton*).

DIRE'CT. *a.* (*directus*, Latin.) 1. Straight; not crooked. 2. Not oblique (*Bentley*). 3. Not collateral. 4. Apparently tending to some end (*Sidney*). 5. Open; not ambiguous (*Bacon*). 6. Plain; express (*Locke*).

DIRECT, in astronomy, is applied to a planet when it appears to move according to the order of the signs. When a planet is direct, its motion and other phenomena are designated by the term direction.

Direct, a character used in music, at the end of a staff, especially at the foot of a page, to shew the place of the first note in the next staff: it is this, W.

To **Dire'ct.** *v. a.* (*directum*, Latin.) 1. To aim in a straight line (*Pope*). 2. To point against, as a mark (*Dryden*). 3. To regulate; to adjust (*Ecclus.*). 4. To prescribe certain measures; to mark out a certain course (*Job*). 5. To order; to command.

DIRE'CTION. *s.* (*directio*, Latin.) 1. Aim at a certain point (*Smalridge*). 2. Tendency of motion impressed by a certain impulse (*Locke*). 3. Order; command; prescription (*Hooker*). 4. Regularity; adjustment (*Pope*).

Direction, is also a kind of calculus whereby astrologers pretend to find when any notable accident shall befal the person whose horoscope is drawn. In their own language, the direction is the calculation of the time when the significator shall meet the portender.

Direction of motion, in mechanics, the situation of the straight line along which any motion is performed, or which is a tangent to that part of the curve in which a moving body is at any time.

Direction (Line of), in mechanics, is a straight line supposed to be drawn from the centre of gravity of any body directly towards the centre of the earth.

DIRE'CTIVE. *a.* (from *direct.*) 1. Having the power of direction (*Bramhall*). 2. Informing; showing the way (*Thomson*).

DIRE'CTLY. *ad.* (from *direct.*) 1. In a straight line; rectilineally (*Dryden*). 2. Immediately; apparently (*Hooker*).

DIRE'CTNESS. *s.* (from *direct.*) Straightness; tendency to any point; the nearest way (*Bentley*).

DIRE'CTOR. *s.* (*director*, Latin.) 1. One that has authority over others; a superintendent (*Swift*). 2. A rule; an ordinance (*Swift*). 3. An instructor (*Hooker*). 4. One who is consulted in cases of conscience (*Dryden*).

Dire'ctor. *s.* (*director*, Latin.) 1. One that directs; one that prescribes. 2. An instrument that serves to guide any manual operation.

Director, in surgery, a grooved instrument for guiding an incision-knife, as used in lithotomy, or operating for the stone, and in some other cases.

Director, in commercial polity, a person who has the management of the affairs of a trading company: thus we say, the directors of the India company, South sea company, &c.

DIRE'CTORY. *s.* (from *director.*) The books which the factious preachers published in the rebellion, for the direction of their sect in acts of worship (*Oxford Reasons*).

DIRECTRIX. See **Dirigent.**

Directrix, a particular right line, perpendicular to the axis of a conic section, and frequently referred to by those authors who demonstrate the properties of these curves from the description of them in plano. The indefinite right line DX (fig. 7, Plate 57.) is the directrix, and it is such that if any point S be assumed without it, and, whilst the line SP revolves about S as a centre, a point P moves in it in such a manner that its distance from S shall always be to PE its distance from the line DX, in a given ratio; then the curve described by the point P is a conic section; it is an ellipse, a parabola, or an hyperbola, according as SP is less than, equal to, or greater than, PE. The ratio of SP to PE is called the determining ratio. In the ellipse AD, the distance of the directrix from the vertex, is greater than AS the distance from the vertex to the focus; in the parabola AD is equal to AS, in the hyperbola it is less.

DI'REFUL. *a.* Dire; dreadful (*Pope*).

DI'RENESS. *s.* (from *dire.*) Dismalness; horrour; hideousness (*Shakspeare*).

DIRE'PTION. *s.* (*direptio*, Lat.) The act of plundering.

DIRGE, a solemn and mournful composition performed at funeral processions. The dirge was in very general use with the ancient Greeks and Romans, and was numerously filled, both by voices and instruments. (*Busby*).

DIRIBITORES, officers appointed to distribute tablets to the people at the Roman comitia.

DIRITTA, in the Italian music, a term intimating that the piece is to be played or sung by conjoint degrees.

DIRK. *s.* (Earse.) A kind of dagger (*Tickel*).

To **DIRKE.** *v. a.* To spoil; to ruin (*Spenser*).

DIRT. *s.* (*dryt*, Dutch.) 1. Mud; filth; mire (*Wake*). 2. Meanness: sordidness.

To **Dirt.** *v. a.* (from the noun.) To foul; to bemire; to soil (*Swift*).

Dirt-pie. *s.* (*dirt* and *pie.*) Forms moulded by children of clay (*Suckling*).

DI'RTILY. *ad.* (from *dirty.*) 1. Nastily; foully; filthily. 2. Meanly: sordidly; shamefully (*Donne*).

DI'RTINESS. *s.* (from *dirty.*) 1. Nastiness; filthiness; foulness. 2. Meanness; baseness; sordidness.

DI'RTY. *a.* (from *dirt.*) 1. Foul; nasty; filthy (*Shakspeare*). 2. Sullied; cloudy; not elegant (*Locke*). 3. Mean; base; despicable (*Taylor*).

To **Di'rty.** *v. a.* (from the noun.) 1. To foul; to soil (*Arbuthnot*). 2. To disgrace; to scandalize.

DIRU'PTION. *s.* (*diruptio*, Latin.) 1. The act of bursting, or breaking. 2. The state of bursting, or breaking.

DIS, an inseparable particle, implying commonly a privative or negative signification: as, to *arm*, to *disarm*; to *join*, to *disjoin*.

DISA, in botany, a genus of the class gynandria, order diandria. Spathe one-valved; petals three; the third less than the others; two-parted, gibbous at the base. Four species; all natives of the Cape; herbaceous plants, with elegant blue flowers.

DISABI'LITY. *s.* (from *disable.*) 1. Want of power to do any thing; weakness; impotence (*Raleigh*).

DISABILITY, in law, is when a man is disabled, or made incapable to inherit any lands, or take that benefit which otherwise he might have done: and this may happen four ways; by the act of an ancestor, or of the party himself; by the act of God, or of the law. 1. Disability by the act of the ancestor, is where the ancestor is attainted of high treason, &c. which corrupts the blood of his children, so that they may not inherit his estate. 2. Disability by the act of the party, is where a man binds himself by obligation, that upon surrender of a lease, he will grant a new estate to a lessee; and afterwards he grants over the reversion to another, which puts it out of his power to perform it. 3. Disability by the act of God, is where a man is *non sanæ memoriæ*, whereby he is incapable to make any grant, &c. So that, if he passeth an estate out of him, it may after his death be made void; but it is a maxim in law, "That a man of full age shall never be received to disable his own person." 4. Disability by the act of the law, is where a man, by the sole act of the law, without any thing by him done, is rendered incapable of the benefit of the law; as an alien born, &c.

To DISA'BLE. *v. a.* (*dis* and *able.*) 1. To deprive of force; to weaken (*Davies*). 2. To hinder from action (*Temple*). 3. To impair; to diminish (*Shakspeare*). 4. To deprive of usefulness or efficacy (*Dryden*). 5. To exclude, as wanting proper qualifications (*Wotton*).

To DISABU'SE. *v. a.* (*dis* and *abuse.*) To set free from mistake; to undeceive (*Waller*).

DISACCOMMODA'TION. *s.* (*dis* and *accommodation.*) The state of being unfit or unprepared (*Hale*).

To DISACCU'STOM. *v. a.* (*dis* and *accustom.*) To destroy the force of habit by disuse, or contrary practice.

DISACQUA'INTANCE. *s.* (*dis* and *acquaintance.*) Disuse of familiarity (*South*).

DISADVA'NTAGE. *s.* (*dis* and *advantage.*) 1. Loss; injury to interest: as, he sold to *disadvantage*. 2. Diminution of any thing desirable, as credit, fame, honour (*Dryden*). 3. A state not prepared for defence (*Spenser*).

To DISADVA'NTAGE. *v. a.* To injure an interest of any kind (*Decay of Piety*).

DISADVA'NTAGEABLE. *a.* Contrary to profit; producing loss: not used (*Bacon*).

DISADVANTA'GEOUS. *a.* Contrary to interest; contrary to convenience; unfavourable (*Addison*).

DISADVANTA'GEOUSLY. *ad.* In a manner contrary to interest or profit (*Government of the Tongue*).

DISADVANTA'GEOUSNESS. *s.* Contrariety to profit; inconvenience.

DISADVE'NTUROUS. *a.* Unhappy; unprosperous (*Spenser*).

To DISAFFE'CT. *v. a.* (*dis* and *affect.*) To fill with discontent; to discontent (*Clarendon*).

DISAFFE'CTED. *part. a.* Not disposed to zeal or affection (*Stillingfleet*).

DISAFFE'CTEDLY. *ad.* After a disaffected manner.

DISAFFE'CTEDNESS. *s.* The quality of being disaffected.

DISAFFE'CTION. *s.* (from *disaffect.*) 1. Dislike; ill-will (*Taylor*). 2. Want of zeal for the government (*Swift*). 3. Disorder; bad constitution (*Wiseman*).

DISAFFI'RMANCE. *s.* (*dis* and *affirm.*) Confutation; negation (*Hale*).

To DISAFFO'REST. *v. a.* (*dis* and *forest.*) To throw open to common purposes, by putting away the privileges of a forest (*Bacon*).

To DISAGRE'E. *v. n.* (*dis* and *agree.*) 1. To differ; not to be the same (*Locke*). 2. To differ; not to be of the same opinion (*Dryden*). 3. To be in a state of opposition (*Brown*).

DISAGREE'ABLE. *a.* (from *disagree.*) 1. Contrary; unsuitable (*Pope*). 2. Unpleasing; offensive (*Locke*).

DISAGREE'ABLENESS. *s.* 1. Unsuitableness; contrariety. 2. Unpleasantness; offensiveness (*South*).

DISAGREE'MENT. *s.* (from *disagree.*) 1. Difference; dissimilitude; diversity; not identity; not likeness (*Woodward*). 2. Difference of opinion; contrariety of sentiments (*Hooker*).

To DISALLO'W. *v. a.* (*dis* and *allow.*) 1. To deny authority to any (*Dryden*). 2. To consider as unlawful (*Hooker*). 3. To censure by some posterior act (*Swift*). 4. To censure; not to justify (*South*).

To DISALLO'W *v. n.* To refuse permission; not to grant (*Hooker*).

DISALLO'WABLE. *a.* Not allowable; not to be suffered.

DISALLO'WANCE. *s.* Prohibition (*South*).

To DISA'NCHOR. *v. a.* (from *dis* and *anchor.*) To drive a ship from its anchor.

DISA'NDRA, in botany, a genus of the class heptandria, order monogynia. Calyx seven-parted; corol wheel-shaped, seven-parted; capsule two-celled, many-seeded. One species only; a native of Madeira, affording two varieties.

To DISA'NIMATE. *v. a.* (*dis* and *animate.*) 1. To deprive of life. 2. To discourage; to deject (*Boyle*).

DISANIMA'TION. *s.* (from *disanimate.*) Privation of life (*Brown*).

To DISANNU'L. *v. a.* To annul: to deprive of authority: a barbarous word (*Herbert*).

DISANNU'LMENT. *s.* (from *disannul.*) The act of making void.

To DISAPPE'AR. *v. n.* (*disparoitre*, Fr.) To be lost to view; to vanish out of sight; to fly; to go away (*Milton*).

To DISAPPO'INT. *v. a.* (*dis* and *appoint.*) To defeat of expectation; to balk (*Tillotson*).

DISAPPO'INTMENT. *s.* Defeat of hopes; miscarriage of expectations (*Spectator*).

DISAPPOINTMENT (Isles of), two or more small islands, discovered by commodore Byron, in the S. Pacific ocean. Lat. 10. to 14. 5 S. Lon. 141. 5. to 141. 16 W.

DISAPPROBA'TION. *s.* (*dis* and *approbation.*) Censure; condemnation (*Pope*).

To DISAPPRO'VE. *v. n.* (*disapprouver*, Fr.) 1. To dislike; to censure (*Pope*). 2. To reject as disliked (*Swift*).

DI'SARD. *s.* (ꝺıꞅıȝ, Saxon.) A prattler; a boasting talker (*Skinner*).

To DISA'RM. *v. a.* (*disarmer*, French.) To spoil or divest of arms; to deprive of arms (*Dryden*).

To DISARRA'Y. *v. a.* (*dis* and *array.*) To undress any one; to divest of clothes (*Spenser*).

DISARRA'Y. *s.* (from the verb.) 1. Disorder; confusion (*Hayward*). 2. Undress.

DISASSIDU'ITY. *s.* Absence of care or attention (*Wotton*).

DISA'STER. *s.* (*desastre*, French.) 1. The blast or stroke of an unfavourable planet (*Shakspeare*). 2. Misfortune; grief; mishap; misery (*Pope*).

To DISA'STER. *v. a.* (from the noun.) 1. To blast by an unfavourable star (*Sidney*). 2. To afflict; to mischief (*Shakspeare*).

DISA'STROUS. *a.* (from *disaster.*) 1. Unlucky; not fortunate (*Hayward*). 2. Gloomy; threatening misfortune (*Milton*). 3. Unhappy; calamitous; miserable (*Denham*).

DISA'STROUSLY. *ad.* In a dismal manner.

DISA'STROUSNESS. *s.* Unluckiness.

To DISAVOU'CH. *v. a.* (*dis* and *avouch.*) To retract profession; to disown (*Daniel*).

To DISAVO'W. *v. a.* (*dis* and *avow.*) To disown; to deny knowledge of (*Hayward*).

DISAVO'WAL. *s.* Denial (*Clarissa*).

DISAVO'WMENT. *s.* Denial (*Wotton*).

To DISAU'THORIZE. *v. a.* (*dis* and *authorize.*) To deprive of credit or authority (*Wotton*).

To DISBA'ND. *v. a.* (*dis* and *band.*) 1. To dismiss from military service; to break up an army (*Knolles*). 2. To spread abroad; to scatter (*Woodward*).

To DISBA'ND. *v. n.* 1. To retire from military service; to separate; to break up (*Tillotson*). 2. To be dissolved (*Herbert*).

To DISBA'RK. *v. a.* (*debarquer*, Fr.) To land from a ship; to put on shore (*Fairfax*)

DISBELIE'F. *s.* (from *disbelieve.*) Refusal of credit; denial of belief (*Tillotson*).

To DISBELIE'VE. *v. a.* (*dis* and *believe.*) Not to credit; not to hold true (*Hammond*).

DISBELIE'VER. *s.* One who refuses belief; one who denies a position to be true (*Watts*).

To DISBE'NCH. *v. a.* (*dis* and *bench.*) To drive from a seat (*Shakspeare*).

To DISBRA'NCH. *v. n.* (*dis* and *branch.*) To separate, or break off, as a branch from a tree (*Evelyn*).

To DISBU'D. *v. a.* (with gardeners.) To take away the sprigs newly put forth.

To DISBU'RDEN. *v. a.* (*dis* and *burden.*) 1. To ease of a burden; to unload (*Milton*). 2. To disencumber, discharge, or clear (*Hale*). 3. To throw off a burden (*Addison*).

To DISBU'RDEN. *v. n.* To ease the mind.

To DISBU'RSE. *v. a.* (*debourser*, Fr.) To spend or lay out money (*Spenser*).

DISBU'RSEMENT. *s.* (*deboursement*, Fr.) 1. Act of disbursing or laying out (*Spenser*). 2. Sum spent.

DISBU'RSER. *s.* One that disburses.

DISC, in antiquity. See DISCUS.

DISC, in astronomy. See DISK.

DISCA'LCEATED. *a.* (*discalceatus*, Lat.) Stripped of shoes.

DISCALCEA'TION. *s.* (from *discalceated.*) The act of pulling off the shoes (*Brown*).

To DISCA'NDY. *v. n.* (*dis* and *candy.*) To dissolve; to melt (*Shakspeare*).

DISCANT, in music. See DESCANT.

To DISCA'RD. *v. a.* (*dis* and *card.*) 1. To throw out of the hand such cards as are useless. 2. To dismiss or eject from service or employment (*Swift*).

DISCA'RNATE. *a.* (*dis* and *caro*, flesh; *scarnato*, Italian.) Stripped of flesh (*Glanville*).

To DISCA'SE. *v. a.* To strip; to undress (*Shakspeare*).

To DISCE'RN. *v. a.* (*discerno*, Latin.) 1. To descry; to see (*Proverbs*). 2. To judge; to have knowledge of (*Sidney*). 3. To distinguish (*Boyle*). 4. To make the difference between (*Ben Jonson*).

To DISCE'RN. *v. n.* To make distinction (*Hayward*).

DISCE'RNER. *s.* (from *discern.*) 1. Discoverer; he that descries (*Shakspeare*). 2. Judge; one that has the power of distinguishing (*Clarendon*).

DISCE'RNIBLE. *a.* (from *discern.*) Discoverable; perceptible; apparent (*South*).

DISCE'RNIBLENESS. *s.* Visibleness.

DISCE'RNIBLY. *ad.* (from *discernible.*) Perceptibly; apparently (*Hammond*).

DISCE'RNING. *part. a.* (from *discern.*) Judicious; knowing (*Atterbury*).

DISCE'RNINGLY. *ad.* Judiciously; rationally; acutely (*Garth*).

DISCE'RNMENT. *s.* (from *discern.*) Judgment; power of distinguishing (*Freeholder*).

To DISCE'RP. (from *discerpo*, Lat.) To tear in pieces; to break.

DISCE'RPTIBLE. *s.* (from *discerp.*) Frangible; separable (*More*).

DISCERPTIBI'LITY. *s.* (from *discerptible.*) Liableness to be destroyed by disunion of parts.

DISCE'RPTION. *s.* (from *discerp.*) The act of pulling to pieces.

To DISCHA'RGE. *v. a.* (*decharger*, Fr.) 1. To disburden; to exonerate (*Dryden*). 2. To unload; to disembark (*Kings*). 3. To give vent to any thing; to let fly (*Dryden*). 4. To let off a gun (*Knolles*). 5. To clear a debt by payment (*Locke*). 6. To set free from obligation (*L'Estrange*). 7. To clear from an accusation or crime; to absolve (*Locke*). 8 To perform; to execute (*Dryden*). 9. To put away; to obliterate (*Bacon*). 10. To divest of any office or employment. 11. To dismiss; to release (*Bacon*). 12. To emit (*Wiseman*).

To **Discha'rge.** *v. n.* To dismiss itself; to break up (*Bacon*).

Discha'rge. *s.* (from the verb.) 1. Vent; explosion; emission (*Woodward*). 2. Matter vented (*Sharp*). 3. Disruption; evanescence (*Bacon*). 4. Dismission from an office. 5. Release from an obligation or penalty (*Milton*). 6. Absolution from a crime (*South*). 7. Ransom; price of ransom (*Milton*). 8. Performance; execution (*L'Estrange*). 9. An acquittance from a debt. 10. Exemption; privilege (*Ecclus*).

Discharge of fluids through apertures. See Hydraulics.

DISCHA'RGER. *s.* (from *discharge.*) 1. He that discharges in any manner. 2. He that fires a gun (*Brown*).

Discharger, or **Discharging rod,** in electricity, an instrument invented for the purpose of discharging electric jars, &c. The common discharging rod is nothing more than a semicircular brass wire, furnished with two brass balls, one at each end of the wire. The other, which is of very extensive use in electric experiments, is called the jointed discharging rod. It is furnished with a handle of glass, or baked wood; the legs are moveable, and may be set to any convenient distance. By bringing one of these knobs or points to one coated side of a charged electric, and the other to the other side, or to any conductor connected with it, the communication is completed between the two sides, and the electric is discharged.

Discharger (Universal), contrived by Mr. Henley, consists of a flat board at bottom, about fifteen inches long, four broad, and one thick, into two holes of which are cemented two glass pillars, eight or nine inches asunder; each of these has a turning joint, so composed of caps and pivots, that wire may not only be slided through each joint, but turned, either horizontally or vertically. Each of the wires is furnished with an open ring at one end, and at the other end with a brass ball, which by a short spring socket may be slipt on the pointed extremity, or removed at pleasure. On a cylindrical foot about the midway between the two glass pillars, is a strong circular piece of wood about five inches in diameter, in the surface of which a plate of ivory is inlaid; this board and plate may, by means of screws, be fixed at any required height. The instrument is used in a variety of experiments. Thus, *to reduce thick pieces of glass to powder.* Place a thick piece of glass on the ivory plate of the universal discharger, and a thick piece of ivory on the glass, on which a weight from one to seven pounds is to be placed; take off the balls, bring the points of the wires against the edge of the glass, and pass the discharge through the wires, by connecting one of the wires with the hook of the battery, and forming a communication, when the battery is charged, from the other wire to the ball. By this operation the glass will be broken, and some part of it shivered to an impalpable powder. When the piece of glass is strong enough to resist the shock, the glass is often marked by the explosion with the most lively and beautiful colours that can be imagined.

Fix some very dry white wood between the balls of the universal discharger, the fibres of the wood running in the same direction with the wires: then pass the shock through them, and the wood will be torn to pieces; or run the points into the wood, and then pass the shock, which will answer as well.

DISCI'NCT. *a.* (*discinctus,* Lat.) Ungirded; loosely dressed.

To **DISCI'ND.** *v. a.* (*discindo,* Lat.) To divide; to cut in pieces (*Boyle*).

DISCIPLE. (from *disco,* I learn.) One who learns any thing from another: thus, the followers of any teacher, philosopher, &c. are called disciples. In the Christian sense, they were followers of Jesus Christ, in general; but in a more restrained sense, the disciples denote those alone who were the immediate followers and attendants on his person, of which there were seventy or seventy-two. The names disciple and apostle are often synonymously used in the Gospel history; but sometimes the apostles are distinguished from disciples, as persons selected out of the number of disciples, to be the principal ministers of his religion: of these there were only twelve. The Latins kept the festival of the seventy or seventy-two disciples on July 15th, and the Greeks on January 4th.

To **Disci'ple.** *v. a.* Not in use. 1. To train; to bring up (*Shakspeare*). 2. To punish; to discipline (*Spenser*).

DISCI'PLESHIP. *s.* (from *disciple.*) The state or function of a disciple (*Hammond*).

DI'SCIPLINABLE. *a.* (*disciplinabilis,* Lat.) Capable of instruction.

DI'SCIPLINABLENESS. *s.* (from *disciplinable.*) Capacity of instruction (*Hale*).

DISCIPLINA'RIAN. *a.* (from *discipline.*) Pertaining to discipline (*Glanville*).

Disciplina'rian. *s.* (*disciplina,* Lat.) 1. One who rules or teaches with great strictness. 2. A follower of the Presbyterian sect, so called from their perpetual urgency about discipline (*Saunderson*).

DI'SCIPLINARY. *a.* (*disciplina,* Lat.) 1. Pertaining to discipline. 2. Relating to government (*Ferne*). 3. Relating to education (*Milton*).

DI'SCIPLINE. *s.* (*disciplina,* Latin.) 1. Education; instruction; the act of cultivating the mind (*Bacon*). 2. Rule of government; order (*Hooker*). 3. Military regulation (*Shakspeare*). 4. A state of subjection (*Rogers*). 5. Any thing taught; art; science (*Wilkins*).

6. Punishment; chastisement (*Addison*). 7. External mortification (*Taylor*).

To DI'SCIPLINE. *v. a.* 1. To educate; to instruct; to bring up (*Addison*). 2. To regulate; to keep in order (*Derham*). 3. To punish; to correct; to chastise.

To DISCLA'IM. *v. a.* (*dis* and *claim.*) To disown; to deny any knowledge of (*Rogers*).

DISCLA'IMER. *s.* (from *disclaim.*) One that disclaims, disowns, or renounces.

To DISCLO'SE. *v. a.* (*dis* and *close.*) 1. To uncover; to produce from a state of latitancy to open view (*Woodward*). 2. To hatch; to open (*Bacon*). 3. To reveal; to tell (*Addison*).

DISCLO'SER. *s.* (from *disclose.*) One that reveals or discovers.

DISCLO'SURE. *s.* (from *disclose.*) 1. Discovery; production into view (*Bacon*). 2. Act of revealing any secret (*Bacon*).

DISCOBOLI, in antiquity (from δισκος, and βαλλω, I throw;) throwers of the discus.

DISCOLORA'TION. *s.* (from *discolour.*) 1. The act of changing the colour; the act of staining. 2. Change of colour; stain; die (*Arbuthnot*).

To DISCO'LOUR. *v. a.* (*decoloro*, Latin.) To change from the natural hue; to stain (*Temple*).

To DISCO'MFIT. *v. a.* (*desconfire*, Fr.) To defeat; to conquer; to vanquish (*Philips*).

DISCO'MFIT. *s.* (from the verb.) Defeat; rout; overthrow (*Milton*).

DISCO'MFITURE. *s.* (from *discomfit.*) Defeat; loss of battle; rout; overthrow (*Atterbury*).

DISCO'MFORT. *s.* (*dis* and *comfort.*) Uneasiness; sorrow; melancholy; gloom (*Shakspeare*).

To DISCO'MFORT. *v. a.* To grieve; to sadden; to deject (*Sidney*).

DISCO'MFORTABLE. *a.* (from *discomfort.*) 1. That is melancholy and refuses comfort (*Shakspeare*). 2. That causes sadness (*Sidney*).

To DISCOMME'ND. *v. a.* (*dis* and *commend.*) To blame; to censure (*Denham*).

DISCOMME'NDABLE. *a.* Blamable; censurable; deserving blame (*Ayliffe*).

DISCOMME'NDABLENESS. *s.* Blamableness; liableness to censure.

DISCOMMENDA'TION. *s.* Blame; reproach; censure (*Ayliffe*).

DISCOMME'NDER. *s.* One that discommends: a dispraiser.

To DISCOMMO'DE. *v. a.* (*dis* and *commode*, Fr.) To put to inconvenience; to molest.

DISCOMMO'DIOUS. *a.* Inconvenient; troublesome; unpleasing (*Spenser*).

DISCOMMO'DITY. *s.* Inconvenience; disadvantage; hurt; mischief (*Bacon*).

To DISCOMPO'SE. *v. a.* (*decomposer*, Fr.) 1. To disorder; to unsettle (*Clarendon*). 2. To ruffle; to disorder (*Swift*). 3. To disturb the temper (*Dryden*). 4. To offend; to fret: to vex (*Swift*). 5. To displace; to discard: not in use (*Bacon*).

DISCOMPO'SURE. *s.* (from *discompose.*) Disorder; perturbation (*Clarendon*).

To DISCONCE'RT. *v. a.* (*dis* and *concert.*) To unsettle the mind; to discompose (*Collier*).

DISCONFO'RMITY. *s.* Want of agreement; inconsistency (*Hakewill*).

DISCONGRU'ITY. *s.* Disagreement; inconsistency (*Hale*).

DISCO'NSOLATE. *a.* Void of comfort; hopeless; sorrowful; melancholy (*Milton*).

DISCO'NSOLATELY. *ad.* In a disconsolate manner; comfortlesly.

DISCO'NSOLATENESS. *s.* The state of being disconsolate.

DISCONTE'NT. *s.* Want of content; uneasiness at the present state. See CONTENTMENT.

DISCONTE'NT. *a.* Uneasy at the present state; dissatisfied (*Hayward*).

To DISCONTE'NT. *v. a.* To dissatisfy; to make uneasy at the present state (*Dryden*).

DISCONTE'NTED. *participial a.* Uneasy; cheerless; malevolent (*Tillotson*).

DISCONTE'NTEDNESS. *s.* Uneasiness; want of ease; dissatisfaction (*Addison*).

DISCONTE'NTMENT. *s.* The state of being discontented; uneasiness (*Bacon*).

DISCONTI'NUANCE. *s.* (from *discontinue.*) 1. Want of cohesion of parts; disruption (*Bacon*). 2. Cessation; intermission (*Atterbury*).

DISCONTINUA'TION. *s.* (from *discontinue.*) Disruption of continuity; breach of union of parts; disruption; separation (*Newton*).

To DISCONTI'NUE. *v. n.* (*discontinuer*, Fr.) 1. To lose the cohesion of parts (*Bacon*). 2. To lose an established or prescriptive custom or right (*Jeremiah*).

To DISCONTI'NUE. *v. a.* 1. To leave off; to cease any practice or habit (*Bacon*). 2. To break off; to interrupt (*Holder*).

DISCONTINU'ITY. *s.* Disunion of parts; want of cohesion (*Newton*).

DISCONVE'NIENCE. *s.* Incongruity; disagreement (*Bramhall*).

DI'SCORD. *s.* (*discordia*, Latin.) 1. Disagreement; opposition; mutual anger; reciprocal oppugnancy (*Shakspeare*). 2. Difference or contrariety of qualities, particularly of sounds (*Dryden*).

DISCORD, in music, the relation of two sounds which are, of themselves, always disagreeable, whether applied in succession, or consonance: thus the second, fourth, and seventh, with their octaves, and in general, all intervals, except those few which precisely terminate the concords, are called discords. Discords are divided into concinnous and inconcinnous intervals. Concinnous discords are such as are fit for music, next to and in combination with concords. These are relations which in themselves are neither very disagreeable nor agreeable, and have only a good effect in music, as by their mixture and combination with the more natural and essential principles, they produce a variety necessary to our being pleased.

Inconcinnous discords are such as are never chosen in music, as having too great a harshness in them; though even the greatest discord is not without its use. The harmony of discords is that wherein the discords are made use of as the solid and substantial part of harmony: for by a proper interposition of a discord, the succeeding concords receive an additional lustre. Thus discords are in music what strong shades are in painting; and without discords not only the variety, which is the life of music, would be soon exhausted, but the very perfection of such relation of sounds would clog the ear in like manner as sweet and luscious things do the stomach. Besides the concinnous discords used designedly in music, there are several other discord relations which happen unavoidably in an accidental and indirect manner. Discords may transiently pass upon the unaccented part of the measure without much offence to the ear. The discords are, the fifth when joined with the sixth, the fourth with the fifth; and the ninth and seventh, of their own nature, are discords. Discords are introduced into harmony with due preparations, and must be succeeded or resolved by concords. A discord is prepared by substituting it first in the harmony in quality of a concord: that is, the same note is first a concord to the bass note immediately preceding that to which it is a discord. Again, a discord is resolved by being immediately succeeded by a concord, descending from it only by the distance of a major or minor second. Discords must be brought off so as to render them delightful, which they will always be when used by a skilful composer, who will take care, by striking the ear with a disproportionate sound, to awaken a greater attention to that which follows. See DISSONANCE.

To DI'SCORD. *v. n.* (*discordo*, Latin.) To disagree; not to suit with (*Bacon*).

DISCO'RDANCE. DISCO'RDANCY. *s.* (from *discord.*) Disagreement; opposition; inconsistency.

DISCO'RDANT. *a.* (*discordans*, Lat.) 1. Inconsistent; at variance with itself (*Dryden*). 2. Opposite; contrarious (*Cheyne*). 3. Incongruous; not conformable (*Hale*).

DISCO'RDANTLY. *ad.* 1. Inconsistently; in disagreement with itself. 2. In disagreement with another (*Boyle*). 3. Peevishly; in a contradictious manner.

DISCORDIA, in mythology, a malevolent deity, daughter of Nox, and sister to Nemesis, the Parcæ and Death. She was driven from heaven by Jupiter, because she was the cause of continual quarrels. When the nuptials of Peleus and Thetis were celebrated, this goddess was not invited, and the neglect so irritated her that she threw an apple into the midst of the gods, with the inscription of *detur pulchriori*. This apple was the cause of the ruin of Troy, and of infinite misfortunes to the Greeks. (See PARIS.) She is represented with a pale ghastly look, and her garment is torn. Her head is generally entwined with serpents, and she is attended by Bellona. She is supposed to be the cause of all the dissensions which arise upon earth, public as well as private. (*Virgil. Hesiod*).

To DISCO'VER. *v. a.* (*decouvrir*, Fr.) 1. To show; to disclose; to bring to light. 2. To expose to view (*Shakspeare*). 3. To make known; to reveal (*Isaiah*). 4. To ken; to espy (*Acts*). 5. To find out; to obtain information (*Pope*). 6. To detect; to find though concealed (*Milton*). 7. To find things or places not known before (*Shakspeare*).

DISCO'VERABLE. *a.* (from *discover,*) 1. That may be found out (*Watts*). 2. Apparent; exposed to view (*Bentley*).

DISCO'VERER. *s.* (from *discover.*) 1. One that finds any thing not known before; a finder out (*Arbuthnot*). 2. A scout; one who is put to descry the enemy (*Shakspeare*).

DISCO'VERY. *s.* (from *discover.*) 1. The act of finding any thing hidden (*Dryden*). 2. The act of revealing or disclosing any secret (*South*).

In philosophical disquisitions, it is proper to discriminate carefully between invention and discovery. The object of the former is to produce something which had no existence before; that of the latter, to bring to light something which did exist, but which was concealed from common observation. Thus we say, Otto Guericke invented the air-pump; Sanctorius invented the thermometer, Newton and Gregory invented the reflecting telescope; Galileo discovered the solar spots; and Harvey discovered the circulation of the blood. It appears, therefore, that improvements in the arts are properly called inventions; and that facts brought to light by means of observation are properly called discoveries.

Agreeably to this analogy, is the use which we make of these words, when we apply them to subjects purely intellectual. As truth is eternal and immutable, and has no dependence on our belief or disbelief of it, a person who brings to light a truth formerly unknown, is said to make a discovery. A person, on the other hand, who contrives a new method of discovering truth, is called an inventor. Pythagoras, we say, discovered the forty-seventh proposition of Euclid's first book; Newton discovered the binomial theorem: but he invented the method of prime and ultimate ratios; and he invented the method of fluxions. In general, every advancement of knowledge is considered as a discovery; every contrivance by which we produce an effect, or accomplish an end, is considered as an invention.

To DISCOU'NSEL. *v. a.* To dissuade; to give contrary advice: obsolete (*Spenser*).

DISCOUNT, or REBATE, is used for an allowance made on a bill, or any other debt not yet become due, in consideration of making present payment of the bill or debt.

Among merchants and traders, it is usual to allow a sum for discount that is equal to the interest of the debt, calculated for the time till it becomes due: but this is not just; for as the true value of the discount is equal to the difference between the debt and its present worth, it is equal only to the interest of that present worth, instead of the interest on the whole debt. And therefore the rule for finding the true discount is this:

As the amount of 100l. for the given rate and time:

Is to the given sum or debt : :

So is the interest of 100l. for the given rate and time:

To the discount of the debt.

So that, if p be the principal or debt, r the rate of interest per cent. and t the time;

then as $100+rt : p :: rt : \frac{prt}{100+rt}$, which is the true discount. Hence also $p-\frac{prt}{100+rt}$ $=\frac{100p}{100+rt}$ is the present worth, or sum to be received.

For ex. Suppose it be required to find the discount of 250l. for five months, at the rate of 5 per cent. per annum interest. Here $p=250$, $r=5$, and $t=\frac{5}{12}$ or 5 months; then

$$\frac{prt}{100+rt}=\frac{250\times5\times\frac{5}{12}}{100+5\times\frac{5}{12}}=\frac{250\times25}{1200\times25}=\frac{250}{49}=$$

5l. 2s. $\frac{2}{49}$ the discount sought.

A Table of Discounts may be seen in Smart's Tables of Interest, the use of which makes calculations of discount very easy.

To DISCOUNT. *v. a.* To make an abatement on a bill or debt, in consideration of prompt payment.

To DISCOU'NT. *v. a.* To count back; to pay back again (*Swift*).

To DISCOU'NTENANCE. *v. a.* 1. To discourage by cold treatment (*Clarendon*). 2. To abash; to put to shame (*Milton*).

DISCOU'NTENANCE. *s.* Cold treatment; unfriendly regard (*Clarendon*).

DISCOU'NTENANCER. *s.* One that discourages by cold treatment (*Bacon*).

To DISCOU'RAGE *v. a.* (*decourager*, Fr.) 1. To depress; to deprive of confidence; to deject; to dastardise (*King Charles*). 2. To deter; to fright from any attempt.

DISCOU'RAGER. *s.* (from *discourage.*) One that impresses diffidence and terrour (*Pope*).

DISCOU'RAGEMENT. *s.* (from *discourage.*) 1. The act of deterring, or depressing hope. 2. Determent; that which deters (*Wilkins*). 3. The cause of depression, or fear (*Locke*).

DISCOU'RSE. *s.* (*discours*, French.) 1. The act of the understanding, by which it passes from premises to consequences (*Hooker*). 2. Conversation; mutual intercourse of language; talk (*Herbert*). 3 Effusion of language; speech (*Locke*). 4. A treatise; a dissertation either written or uttered (*Pope*).

To DISCOU'RSE. *v. n.* (from the noun.) 1. To converse; to talk; to relate (*Shakspeare*). 2. To treat upon in a solemn or set manner (*Locke*). 3. To reason; to pass from premises to consequences (*Davies*).

To DISCOU'RSE. *v. a.* To treat of; to talk over; to discuss (*Shakspeare*).

DISCOU'RSER. *s.* (from *discourse.*) 1. A speaker; a haranguer (*Shakspeare*). 2. A writer on any subject (*Brown*).

DISCOU'RSIVE. *a.* (from *discourse.*) 1. Passing by intermediate steps from premises to consequences (*Milton*). 2. Containing dialogue; interlocutory (*Dryden*).

DISCOU'RTEOUS. *a.* (*dis* and *courteous.*) Uncivil; uncomplaisant (*Motteux*).

DISCOU'RTEOUSLY. *ad.* Uncivilly; rudely.

DISCOU'RTESY. *s.* Incivility; rudeness (*Sidney*).

DI'SCOUS. *a.* (from *discus*, Lat.) Broad; flat; wide (*Quincy*).

DISCRE'DIT. *s.* (*decrediter*, Fr.) Ignominy; reproach; disgrace (*Rogers*).

To DISCRE'DIT. *v. a.* (*decrediter*, French.) 1. To destroy the reputation of a person or thing. 2. To render a thing suspicious which is believed to be true. 3. To hinder a rumour from spreading by shewing it to be false.

DISCRE'ET. *a.* (*discret*, French.) 1. Prudent; circumspect; cautious (*Whitgift*). 2. Modest; not forward (*Thomson*).

DISCRE'ETLY. *ad.* Prudently; cautiously; circumspectly (*Waller*).

DISCRE'ETNESS. *s.* The quality of being discreet; discretion.

DI'SCREPANCE. *s.* (*discrepantia*, Lat.) Difference; contrariety; disagreement.

DI'SCREPANT. *a.* (*discrepans*, Lat.) Different; disagreeing; contrary.

DISCRE'TE. *a.* (*discretus*, Latin.) 1. Distinct; disjointed; not continuous (*Hale*). 2. Disjunctive.

DISCRETE, OR DISJUNCT, PROPORTION, is that in which the ratio between two or more pairs of numbers is the same, and yet the proportion is not continued, so as that the ratio may be the same between the consequent of one pair and the antecedent of the next pair.

DISCRETE QUANTITY, is such as is not continued and joined together. Such for instance is any number; for its parts, being distinct units, cannot be united into one continuum.

DISCRETION. *s.* (from *discretio*, Lat.) 1. Prudence; knowledge to govern or direct one's self; skill; wise management (*Tillotson*). 2. Liberty of acting at pleasure; uncontrolled and unconditional power.

DISCRE'TIONARY. *a.* (from *discretion.*) Left at large; unlimited; unrestrained (*Tatler*).

DISCRETIONE, a musical term, requiring great care and judgment in the performer.

DISCRE'TIVE. *a.* (*discretus*, Latin.) 1. (In logick.) Discretive propositions are such wherein various, and seemingly opposite, judgments are made, whose variety or distinction is noted by the particles, *but, though, yet,* &c. as, *travellers may change their climate,* but *not their temper.* 2. (In grammar.) Discretive distinctions are such as imply opposition: as, *not a man*, but *a beast*

DISCRI'MINABLE. *a.* (from *discriminate.*) Distinguishable by outward marks or tokens.

To DISCRI'MINATE. *v. a.* (*discrimino,* Lat.) 1. To mark with notes of difference (*South*). 2. To select or separate from others (*Boyle*).

DISCRI'MINATENESS. *s.* Distinctness.

DISCRIMINA'TION. *s.* (*discriminatio,* Lat.) The state of being distinguished from other persons or things (*Stillingfleet*). 2. The act of distinguishing one from another; distinction (*Addison*). 3. The mark of distinction (*Holder*).

DISCRI'MINATIVE. *a.* (from *discriminate.*) 1. That makes the mark of distinction; characteristical (*Woodward*). 2. That observes distinction (*More*).

DISCRI'MINOUS. *a.* (from *discrimen,* Lat.) Dangerous; hazardous: not usual (*Harvey*).

DISCU'BITORY. *a.* (*discubitorius,* Lat.) Fitted to the posture of leaning (*Brown*).

DISCU'MBENCY. *s.* (*discumbens,* Lat.) The act of leaning at meat (*Brown*).

To DISCU'MBER. *v. a.* (*dis* and *cumber.*) To disengage from any troublesome weight (*Pope*).

To DISCU'RE. *v. a.* (*decouvrir,* Fr.) To discover; to reveal: not used (*Spenser*).

DISCU'RSIVE. *a.* (*discursif,* French.) 1. Moving here and there; roving (*Bacon*). 2. Proceeding by gradation from premises to consequences; argumentative (*More*).

DISCU'RSIVELY. *ad.* By due gradation of argument (*Hale*).

DISCU'RSORY. *a.* (*discursor,* Lat.) Argumental; rational.

DISCUS, in antiquity, a quoit made of stone, iron, or copper, nearly a foot long, inclining to an oval figure, which was hurled in form of a bowl, to a vast distance, by the help of a leathern thong tied round the person's hand who threw it, and put through a hole in the middle. Homer has made Ajax and Ulysses great adepts at this sport.

Discus, among the ancients, also signified a round shield consecrated to the memory of some hero, and hung up in the temple of some god.

Discus, in astronomy, is derived from the above. See Disk.

To DISCU'SS. *v. a.* (*discussum,* Latin.) 1. To examine; to ventilate (*Pope*). 2. To disperse (*Wotton*). 3. To break to pieces (*Brown*).

DISCU'SSER. *s.* (from *discuss.*) He that discusses; an examiner.

DISCU'SSION. *s.* (from *discuss.*) 1. Disquisition; examination; ventilation of a question (*Prior*). 2. (In surgery.) A breathing out the humours by insensible transpiration (*Wiseman*).

DISCU'SSIVE. *a.* (from *discuss.*) Having the power to discuss or disperse.

DISCUTIENTS. (*discutientia,* from *discutio,* to shake in pieces.) A term in surgery applied to those substances which possess a power of repelling or resolving tumours.

To DISDA'IN. *v. a.* (*dedaigner,* French.) To scorn; to consider as unworthy of one's character (*Addison*).

Disda'in. *s.* (*sdegno,* Italian.) Contempt; scorn; indignation (*Ecclus*).

Disdain is such a degree of contempt as precludes any commerce with the party despised. It considers him as totally unworthy of our notice; even of our reprehension, which always supposes a possibility of being reclaimed.

DISDA'INFUL. *a.* (*disdain* and *full.*) Contemptuous; haughtily scornful; indignant (*Hooker*).

DISDA'INFULLY. *ad.* Contemptuously; with haughty scorn; with indignation (*South*).

DISDA'INFULNESS. *s.* Contempt; contemptuousness; haughty scorn (*Ascham*).

DISDIAPASON, in music, a double octave, or fifteenth. The extremes of the disdiapason limited the ancient scale, or diagramma: and, in practice, they are generally found to limit the voice; for there are very few singers who can stretch their voice beyond a double octave, without disfiguring it by the effort, and thus making what is called a false voice.

DISEA'SE. *s.* (*dis* and *ease.*) Distemper; malady; sickness; morbid state (*Swift*).

Disease. (*morbus.*) An alteration of any kind from a state of perfect health. It is termed general when it pervades the entire system, and does not depend upon any partial or local affection: and partial or local when confined to an individual organ.

Diseases are also distributed into original, or idiopathic, and secondary or symptomatic: both of which may be either general or partial. They are also denominated from the causes that produce them, as Endemic, Epidemic, Sporadic, &c. all which see, as also Medicine.

To Disea'se. *v. a.* (from the noun.) 1. To afflict with disease; to torment with sickness; to make morbid (*Shakspeare*). 2. To put to pain; to make uneasy (*Locke*).

DISEA'SEDNESS. *s.* (from *diseased.*) Sickness; morbidness (*Burnet*).

DISE'DGED. *a.* Blunted; obtunded (*Shakspeare*).

To DISEMBA'RK. *v. a.* To carry to land (*Shakspeare*).

To Disemba'rk. *v. n.* To go on land (*Pope*).

To DISEMBI'TTER. *v. a* (*dis* and *embitter.*) To sweeten; to free from bitterness (*Addison*).

DISEMBO'DIED. *a.* Divested of the body.

To DISEMBO'GUE. *v. d.* (*disemboucher,* old Fr.) To pour out at the mouth of a river; to vent (*Addison*).

To Disembo'gue. *v. n.* To gain a vent; to flow (*Cheyne*).

DISEMBO'WELLED. *part. a.* (*dis* and *embowel.*) Taken from out the bowels (*Philips*).

To DISEMBRO'IL. *v. a.* (*debouiller*, Fr.) To disentangle; to free from perplexity (*Dryden*).

To DISENA'BLE. *v. a.* To deprive of power; to sink into weakness (*Dryden*).

To DISENCHA'NT. *v. a.* To free from the force of an enchantment (*Denham*).

To DISENCU'MBER. *v. a.* (*dis* and *encumber.*) 1. To discharge from encumbrances; to disburden; to exonerate (*Spratt*). 2. To free from obstruction of any kind (*Addison*).

DISENCU'MBRANCE. *s.* Freedom from encumbrance and obstruction (*Spectator*).

To DISENGA'GE. *v. a.* (*dis* and *engage.*) 1. To separate from any thing with which it is in union (*Burnet*). 2. To disentangle; to clear from impediments or difficulties (*Waller*). 3. To withdraw the affection; to wean; to abstract the mind (*Atterbury*). 4. To free from any powerful detention (*Denham*). 5. To release from an obligation.

To Disenga'ge. *v. a.* To set one's self free from (*Collier*).

DISENGA'GED. *participial a.* 1. Disjoined; disentangled. 2. Vacant; at leisure. 3. Released from obligation.

DISENGA'GEDNESS. *s.* The quality of being disengaged; vacuity of attention.

DISENGA'GEMENT. *s.* (from *disengage.*) 1. Release from any engagement, or obligation. 2. Freedom of attention; vacancy.

To DISENTA'NGLE. *v. a.* 1. To unfold or loose the parts of any thing interwoven with one another (*Boyle*). 2. To set free from impediments; to clear from perplexity or difficulty (*Clarendon*). 3. To disengage; to separate (*Stillingfleet*).

To DISENTE'RRE. *v. a.* To unbury (*Brown*)

To DISENTHRA'L. *v. a.* To set free; to restore to liberty; to rescue from slavery (*Sandys*).

To DISENTHRO'NE. *v. a.* To depose from sovereignty; to dethrone (*Milton*).

To DISENTRA'NCE. *v. a.* To awaken from a trance, or deep sleep (*Hudibras*).

To DISESPOU'SE. *v. a.* To separate after faith plighted (*Milton*).

DISESTE'EM. *s.* (*dis* and *esteem.*) Slight regard (*Locke*).

To Disestee'm. *v. a.* (from the noun.) To regard slightly (*Chapman*).

DISESTIMATION. *s.* Disrespect; disesteem.

DISFA'VOUR. *s.* (*dis* and *favour.*) 1. Discountenance; unpropitious regard (*Bacon*). 2. A state of ungraciousness or unacceptableness (*Spelman*). 3. Want of beauty.

To Disfa'vour. *v. a.* (from the noun.) To discountenance; to withhold or withdraw kindness (*Swift*).

DISFIGURATION. *s.* (from *disfigure.*) 1. The act of disfiguring. 2. The state of being disfigured. 3. Deformity.

To DISFI'GURE. *v. a.* (*dis* and *figure.*) To change any thing to a worse form; to deform; to mangle (*Locke*).

DISFI'GUREMENT. *s.* (from *disfigure.*) Defacement of beauty; change of a better form to a worse (*Suckling*).

To DISFO'REST. *v. a.* To reduce land from the privileges of a forest to the state of common land.

To DISFRA'NCHISE. *v. a.* To deprive of privileges or immunities.

DISFRA'NCHISEMENT. *s.* The act of depriving of privileges.

To DISFU'RNISH. *v. a.* To deprive; to unfurnish; to strip (*Knolles*).

To DISGA'RNISH. *v. a.* 1. To strip of ornaments. 2. To take guns from a fortress.

To DISGLO'RIFY. *v. a.* To deprive of glory; to treat with indignity (*Milton*).

To DISGO'RGE. *v. a.* (*degorger*, Fr.) 1. To discharge by the mouth (*Dryden*). 2. To pour out with violence (*Derham*).

DISGRA'CE. *s.* (*disgrace*, French.) 1. State of being out of favour. 2. State of ignominy; dishonour (*Shakspeare*). 3. Act of unkindness: obsolete (*Sidney*). 4. Cause of shame (*Brown*).

To Disgra'ce. *v. a.* 1. To bring a reproach upon; to dishonour, as an agent (*Hooker*). 2. To bring to shame, as a cause. 3. To put out of favour.

DISGRA'CEFUL. *a.* (*disgrace* and *full.*) Shameful; ignominious; reproachful (*Taylor*).

DISGRA'CEFULLY. *ad.* In disgrace; with indignity; ignominiously (*Ben Jonson*).

DISGRA'CEFULNESS. *s.* Ignominy.

DISGRA'CER. *s.* One that exposes to shame; one that causes ignominy (*Swift*).

DISGRA'CIOUS. *a.* Unpleasing (*Shakspeare*).

To DISGUI'SE. *v. a.* (*deguiser*, French.) 1. To conceal by an unusual dress (*Shakspeare*). 2. To hide by a counterfeit appearance. 3. To disfigure; to change the form (*Dryden*). 4. To deform by liquor (*Spectator*).

Disgui'se. *s.* (from the verb.) 1. A dress contrived to conceal the person that wears it (*Addison*). 2. A false appearance (*Pope*). 3. Disorder by drink (*Shakspeare*).

DISGUI'SEMENT. *s.* (from *disguise.*) Dress of concealment (*Sidney*).

DISGUI'SER. *s.* (from *disguise.*) 1. One that puts on a disguise (*Swift*). 2. One that conceals another by a disguise; one that disfigures (*Shakspeare*).

DISGU'ST. *s.* (*degout*, French.) 1. Aversion of the palate from any thing. 2. Ill humour; malevolence; offence conceived (*Locke*).

To Disgu'st. *v. a.* (*degouter*, French.) 1. To raise aversion in the stomach; to distaste. 2. To strike with dislike; to offend (*Watts*). 3. To produce aversion (*Swift*).

DISGU'STFUL. *a.* Nauseous (*Swift*).

DISH. *s.* (ꝺiꞅc, Saxon; *discus*, Latin.) 1. A broad wide vessel, in which food is served up at the table (*Dryden*). 2. A deep hollow vessel for liquid food (*Milton*). 3. The meat served in a dish; any particular kind of food (*Shakspeare*).

To Dish. *v. a.* To serve in a dish (*Shakspeare*).

DISH-CLOUT. *s.* (*dish* and *clout.*) The cloth with which the maids rub their dishes (*Swift*).

DISH-WASHER. *s.* The name of a bird.

DISHABI'LLE. *a.* (*deshabillé*, Fr.) Undressed; loosely or negligently dressed (*Dryden*).

Dishabi'lle. *s.* Undress; loose dress (*Clarissa*).

To DISHA'BIT. *v. a.* To throw out of place; to drive from their habitation (*Shakspeare*).

DISHA'RMONY. *s.* Contrariety to harmony

To DISHEA'RTEN. *v. a.* To discourage; to deject; to terrify; to depress (*Milton*).

DISHE'RISON. *s.* The act of debarring from inheritance.

To DISHE'RIT. *v. a.* (*dis* and *inherit.*) To cut off from hereditary succession (*Spenser*).

To DISHE'VEL. *v. a.* (*decheveler*, Fr.) To spread the hair disorderly (*Knolles*).

DI'SHING. *a.* Concave (*Mortimer*).

DISHO'NEST. *a.* (*dis* and *honest.*) 1. Void of probity; void of faith; faithless; fraudulent (*South*). 2. Unchaste; lewd (*Shakspeare*). 3. Disgraced; dishonoured (*Dryden*). 4. Disgraceful; ignominious (*Pope*).

DISHO'NESTLY. *ad.* 1. Without faith; without probity; faithlessly; wickedly (*Shakspeare*). 2. Lewdly; wantonly; unchastely (*Eccles*).

DISHO'NESTY. *s.* 1. Want of probity; faithlessness (*Swift*). 2. Unchastity; incontinence (*Shakspeare*).

DISHO'NOUR. *s.* (*dis* and *honour.*) 1. Reproach; disgrace; ignominy (*Boyle*). 2. Reproach uttered; censure (*Shakspeare*).

To Disho'nour. *v. a.* 1. To disgrace; to bring shame upon; to blast with infamy (*Shakspeare*). 2. To violate chastity. 3. To treat with indignity (*Dryden*).

DISHO'NOURABLE. *a.* 1. Shameful; reproachful; ignominious (*Daniel*). 2. Being in a state of neglect or disesteem.

DISHO'NOURER. *s.* (from *dishonour.*) 1. One that treats another with indignity (*Milton*). 2. A violator of chastity.

To DISHO'RN. *v. a.* To strip of horns (*Shakspeare*).

DISHU'MOUR. *s.* Peevishness; ill humour, uneasy state of mind (*Spectator*).

DISIMPRO'VEMENT. *s.* Reduction from a better to a worse state (*Norris*).

To DISINCA'RCERATE. *v. a.* To set at liberty: to free from prison (*Harvey*).

DISINCLINA'TION. *s.* Want of affection; slight; dislike (*Arbuthnot*).

To DISINCLI'NE. *v. a.* (*dis* and *incline.*) To produce dislike to; to make disaffected; to alienate affection from (*Clarendon*).

DISINGENU'ITY. *s.* Meanness of artifice; unfairness (*Clarendon*).

DISINGE'NUOUS. *a.* Unfair; meanly artful; vitiously subtle; sly; crafty; illiberal.

DISINGE'NUOUSLY. *ad.* In a disingenuous manner.

DISINGE'NUOUSNESS. *s.* Mean subtilty; low craft (*Government of the Tongue*).

DISINHE'RISON. *s.* (*dis* and *inherit.*) 1. The act of cutting off from any hereditary succession (*Clarendon*). 2. The state of being cut off from an hereditary right (*Taylor*).

To DISINHE'RIT. *v. a.* To cut off from an hereditary right (*Davies*).

To DISINTE'R. *v. a.* To unbury; to take as out of the grave (*Addison*).

DISINTERE'SSED. *a.* (*dis* and *interesse*, Fr.) Void of regard to private advantage; impartial (*Dryden*).

DISINTERE'SSMENT. *s.* (*dis* and *interessment*, Fr.) Disregard to private advantage; disinterest; disinterestedness (*Prior*).

DISI'NTEREST. *s.* (*dis* and *interest.*) 1. What is contrary to one's wish or prosperity (*Glanville*). 2. Indifference to profit.

DISI'NTERESTED. *a.* (from *disinterest.*) 1. Superiour to regard of private advantage; not influenced by private profit (*Swift*). 2. Without any concern in an affair.

DISINTERE'STEDLY. *ad.* In a disinterested manner.

DISINTERE'STEDNESS. *s.* (from *disinterested.*) Contempt of private interest (*Brown*).

To DISI'NTRICATE. *v. a.* To disentangle.

To DISINVI'TE. *v. a.* (*dis* and *invite.*) To retract an invitation.

To DISJO'IN. *v. a.* (*dejoindre*, Fr.) To separate; to part from each other (*Milton*).

To DISJO'INT. *v. a.* (*dis* and *joint.*) 1. To put out of joint (*Sandys*). 2. To break at junctures; to separate at the part where there is a cement (*Irene*). 3. To break in pieces (*Blackmore*). 4. To carve a fowl. 5. To make incoherent (*Sidney*).

To Disjoi'nt. *v. n.* To fall in pieces (*Shakspeare*).

Disjo'int. *particip.* (from the verb.) Separated; divided (*Shakspeare*).

DISJU'NCT. *a.* (*disjunctus*, Lat.) Disjoined; separate.

DISJU'NCTION. *s.* (from *disjunctio*, Lat.) Disunion; separation; parting (*South*).

DISJU'NCTIVE. *a.* (*disjunctivus*, Latin.) 1. Incapable of union (*Grew*). 2. That marks separation or opposition: as, *I love him*, or *fear him* (*Watts*). 3. (In logick.) A disjunctive proposition is when the parts are opposed to one another by disjunctive particles: as, *It is either day* or *night*.

DISJU'NCTIVELY. *ad.* Distinctly; separately (*Decay of Piety*).

DISK, or Disc. (δισκος, Gr.) In astronomy, the body or face of the sun or moon, such as it appears to us. Though each of these bodies is nearly spherical, it appears as a circular plane, and this is the disk.

Disk of a leaf, in botany, the whole

surface; *supine*, the upper; *prone*, the under surface. *Disk* of a flower, is the central part in radiate compound flowers, consisting generally of regular corollules or florets: it is applied to other aggregate flowers, when the florets towards the middle differ from those in the circumference; as in umbels.

DISKI'NDNESS. *s.* 1. Want of kindness; want of affection. 2. Ill turn; injury; detriment (*Woodward*).

DISLI'KE. *s.* 1. Disinclination; absence of affection (*Spenser*). 2. Discord; dissension: not in use (*Fairfax*).

To Disli'ke. *v. a.* (*dis* and *like.*) To disapprove; to regard without affection (*Temple*).

DISLI'KEFUL. *a.* (*dislike* and *full.*) Disaffected; malign: not in use (*Spenser*).

To DISLI'KEN. *v. a.* (*dis* and *like.*) To make unlike: not usual (*Shakspeare*).

DISLI'KENESS. *s.* Dissimilitude; not resemblance; unlikeness (*Locke*).

DISLI'KER. *s.* A disapprover; one that is not pleased (*Swift*).

To DISLI'MB. *v. a.* (*dis* and *limb.*) To dilaniate; to tear limb from limb.

To DISLI'MN. *v. a.* (*dis* and *limn.*) To unpaint; to strike out of a picture (*Shaks.*)

To DI'SLOCATE. *v. a.* (*dis* and *locus*, Latin.) 1. To put out of the proper place (*Woodward*). 2. To put out of joint (*Shakspeare*).

DISLOCA'TION. *s.* (from *dislocate.*) 1. The act of shifting the places of things. 2. The state of being displaced (*Burnet*). 3. A luxation; a joint put out. See Luxation.

To DISLO'DGE. *v. a.* (*dis* and *lodge.*) 1. To remove from a place (*Woodward*). 2. To remove from a habitation (*Dryden*). 3. To drive an enemy from a station (*Dryden*). 4. To remove an army to other quarters (*Shakspeare*).

To Dislo'dge. *v. n.* To go away to another place (*Milton*).

DISLO'YAL. *a.* (*desloyal*, French.) 1. Not true to allegiance; faithless; false to a sovereign; disobedient (*Milton*). 2. Dishonest; perfidious: obsolete (*Shakspeare*). 3. Not true to the marriage bed: obsolete (*Shakspeare*). 4. False in love; not constant: obsolete.

DISLO'YALLY. *ad.* Not faithfully; treacherously; disobediently.

DISLO'YALTY. *s.* (from *disloyal.*) 1. Want of fidelity to the sovereign (*K. Charles*). 2. Want of fidelity in love: obsolete (*Shakspeare*).

DISMA'L. *a.* (*dies malus*, Latin, an evil day.) Sorrowful; dire; horrid; melancholy; uncomfortable; unhappy; dark (*Decay of Piety*).

DI'SMALLY. *ad.* Horribly; sorrowfully.

DI'SMALNESS. *s.* Horrour; sorrow.

To DISMA'NTLE. *v. a.* (*dis* and *mantle.*) 1. To deprive of a dress; to strip (*South*). 2. To loose; to throw off a dress (*Shakspeare*). 3. To strip a town of its outworks (*Hakewill*). 4. To break down any thing external (*Dry.*).

To DISMA'SK. *v. a.* To divest of a mask; to uncover from concealment (*Wotton*).

To DISMA'Y. *v. a.* (*desmayar*, Spanish.) To terrify; to discourage; to affright (*Raleigh*).

Disma'y. *s.* (*desmayo*, Spanish.) Fall of courage; terrour felt; desertion of mind; fear impressed (*Milton*).

DISMA'YEDNESS. *s.* (from *dismay.*) Dejection of courage; dispiritedness (*Sidney*).

DISME. *s.* (French.) A tenth; the tenth part; tithe (*Shakspeare*).

To DISME'MBER. *v. a.* To divide member from member; to cut in pieces (*Swift*).

To DISMI'SS. *v. a.* (*dismissus*, Latin.) 1. To send away (*Acts*). 2. To give leave of departure (*Dryden*). 3. To discard; to divest of an office.

DISMI'SSION. *s.* (from *dismissio*, Latin.) 1. Dispatch; act of sending away (*Dryden*). 2. An honourable discharge from any office or place (*Milton*). 3. Deprivation; obligation to leave any post or place (*Shakspeare*).

To DISMO'RTGAGE. *v. a.* (*dis* and *mortgage.*) To redeem from mortgage (*Howel*).

To DISMO'UNT. *v. a.* (*demonter*, Fr.) 1. To throw off a horse (*Shakspeare*). 2. To throw from any elevation. 3. To throw a cannon from its carriage (*Knol.*).

To Dismo'unt. *v. n.* 1. To alight from a horse (*Addison*). 2. To descend from any elevation.

To DISNA'TURALIZE. *v. a.* (*dis* and *naturalize.*) To alienate; to make alien.

DISNA'TURED. *a.* (*dis* and *nature.*) Unnatural; wanting natural tenderness (*Shaks.*).

DISOBE'DIENCE. *s.* (*dis* and *obedience.*) 1. Violation of lawful command or prohibition; breach of duty due to superiours (*Shakspeare*). 2. Incompliance (*Blackmore*).

DISOBE'DIENT. *a.* Not observant of lawful authority (*Kings*).

To DISOBE'Y. *v. a.* (*dis* and *obey.*) To break commands, or transgress prohibitions (*Denham*).

DISOBLIGA'TION. *s.* (*dis* and *obligation.*) Offence; cause of disgust (*Clarendon*).

To DISOBLI'GE. *v. a.* (*dis* and *oblige.*) To offend; to disgust; to give offence to (*Addison*).

DISOBLI'GING. *part. a.* Disgusting; unpleasing; offensive (*Gov. of Tongue*).

DISOBLI'GINGLY. *ad.* In a disgusting or offensive manner; without attention to please.

DISOBLI'GINGNESS. *s.* Offensiveness; readiness to disgust.

DISO'RBED. *a.* (*dis* and *orb.*) Thrown out of the proper orbit (*Shakspeare*).

DISO'RDER. *s.* (*disordre*, French.) 1. Want of regular disposition; irregularity; confusion (*Spectator*). 2. Tumult; disturbance; bustle (*Waller*). 3. Neglect of rule; irregularity (*Pope*). 4. Breach of laws; violation of standing institution (*Wisdom*). 5. Breach of that regularity in the animal economy which causes health; sickness; distemper (*Locke*). 6. Discomposure of mind.

To DISO'RDER. *v. a.* (*dis* and *order.*) 1. To throw into confusion; to confound; to disturb; to ruffle (*Milton*). 2. To make sick; to disturb the body. 3. To discompose; to disturb the mind. 4. To turn out of holy orders (*Dryden*).

DISO'RDERED. *a.* (from *disorder.*) Disorderly; irregular; vitious; loose (*Shaks.*).

DISO'RDEREDNESS. *s.* Irregularity; want of order; confusion (*Knolles*).

DISO'RDERLY. *a.* (from *disorder.*) 1. Confused; immethodical (*Hale*). 2. Irregular; tumultuous (*Addison*). 3. Lawless; contrary to law; inordinate; vitious (*Bacon*).

DISO'RDERLY. *ad.* 1. Without rule; without method; irregularly; confusedly (*Raleigh*). 2. Without law; inordinately (*Thessalonians*).

DISO'RDINATE. *a.* Not living by the rules of virtue; inordinate (*Milton*).

DISO'RDINATELY. *ad.* Inordinately; vitiously.

DISO'RIENTATED. *a.* (*dis* and *orient.*) Turned from the east; turned from the right direction (*Harris*).

To DISO'WN. *v. a.* (*dis* and *own.*) 1. To deny; not to allow (*Dryden*). 2. To abnegate; to renounce (*Swift*).

To DISPA'ND. *v. a.* (*dispando,* Latin.) To display; to spread abroad.

DISPA'NSION. *s.* (from *dispansus,* Lat.) The act of displaying; diffusion; dilatation.

To DISPA'RAGE. *v. a.* (from *dispar,* Latin.) 1. To marry any one to another of inferiour condition. 2. To match unequally; to injure by union with something inferiour in excellence. 3. To injure by a comparison with something of less value. 4. To treat with contempt; to mock; to flout; to reproach (*Milton*). 5. To bring reproach upon; to be the cause of disgrace (*Atterbury*).

DISPA'RAGEMENT. *s.* (from *disparage.*) 1. Injurious union, or comparison with something of inferiour excellence (*L'Estrange*). 2. (In law.) Matching an heir in marriage under his or her degree, or against decency (*Sidney*). 3. Reproach; disgrace; indignity (*Wotton*).

DISPA'RAGER. *s.* One that disgraces.

DI'SPARATES. *s.* (*disparata,* Latin.) Things so unlike that they cannot be compared with each other.

DISPA'RITY. *s.* (from *dispar,* Latin.) 1. Inequality; difference in degree either of rank or excellence (*Rogers*). 2. Dissimilitude; unlikeness.

To DISPA'RK. *v. a.* (*dis* and *park.*) 1. To throw open a park (*Shakspeare*). 2. To set at large; to release from enclosure (*Waller*).

To DISPA'RT. *v. a.* (*dis* and *part*; *dispertior,* Latin.) To divide in two; to separate; to break; to burst; to rive (*Dier*).

DISPART, in gunnery, is the setting a mark upon the muzzle-ring, or thereabouts, of a piece of ordnance, so that a sight line taken upon the top of the base ring against the touch-hole, by the mark set on or near the muzzle, may be parallel to the axis of the concave cylinder. The common way of doing this, is to take the two diameters of the base ring, and of the place where the dispart is to stand, and divide the difference between them into two equal parts, one of which will be the length of the dispart which is set on the gun with wax or pitch, or fastened there with a piece of twine or marlin. By means of an instrument it may be done with all possible nicety.

DISPA'SSION. *s.* (*dis* and *passion.*) Freedom from mental perturbation (*Temple*).

DISPA'SSIONATE. *s.* (*dis* and *passionate.*) Cool; calm; moderate; temperate (*Clarendon*).

DISPATCH, or DESPATCH, a letter on some affair of state, or other business of importance, sent with care and expedition by a courier express. The business of dispatches lies on the secretaries of state and their clerks. The king gives directions to his ministers abroad by dispatches. The word is also used for the packet or mail-containing such letters. The French, during the reign of Louis XIV. had a *conseil des depêchés,* "council of dispatches," held in the king's presence, at which the dauphin, the duke of Orleans, the chancellor, and four secretaries of state, assisted.

To DISPE'L. *v. a.* (*dispello,* Latin.) To drive by scattering; to dissipate (*Locke*).

DISPE'NCE. *s.* (*dispense,* Fr.) Expence; cost; charge; profusion (*Spenser*).

To DISPE'ND. *v. a.* (*dispendo,* Lat.) To spend; to consume; to expend (*Spenser*).

DISPENSARY. (from *dispenso,* to distribute.) The shop or place in which medicines are prepared.

The word dispensary is used more particularly to denote a charitable institution very common in London and some other large towns of Britain. They are supported by voluntary subscriptions, and each has one or more physicians, surgeons, and apothecaries, who attend, or ought to attend at stated times, in order to prescribe for the poor, and if necessary to visit them at their own habitations. The poor are supplied with medicines gratis. Where these institutions are managed with care, they are of the utmost importance to society: it being unquestionably more for the comfort of the sick to be attended at their own houses, than to be dragged from their families to an hospital.

DISPENSA'TION. *s.* (from *dispensatio,* Latin.) 1. Distribution; the act of dealing out any thing (*Woodward*). 2. The dealing of God with his creatures; method of providence (*Taylor*). 3. An exemption from some law; a permission to do something forbidden (*Ward*).

DISPENSATION, in law, &c. a permission to do something contrary to the standing laws; or a relaxation, or suspension of a law, on some just occasion.

Some confound dispensation with equity; but they are very different things; for equity is only the correction, or modification, of a law which is too general; but a dispensation suspends the obligation of the law itself, and can, therefore, be only given by the legislative power.

The archbishop of Canterbury has a power, by stat. 25 Hen. VIII. c. 21. of dispensing in any case, within the realm, wherein dispensations, not contrary to the law of God, were formerly granted by the see of Rome, as well to the king as to his subjects: but in extraordinary matters, or in a case that is new, the king and council are to be consulted; and the dispensation must be confirmed under the broad seal: and during the vacancy of the archbishop's see, the guardian of the spiritualities may grant dispensations. Every bishop, of common right, has the power of dispensing in common cases.

DISPENSA'TOR. *s.* (Lat.) One employed in dealing out any thing; a distributer (*Bac.*).

DISPE'NSATORY. *s.* (from *dispense.*) A book in which the composition of medicines is described and directed; a pharmacopeia (*Hammond*).

To DISPE'NSE. *v. a.* (*dispenser*, French.) 1. To deal out; to distribute (*D. of Piety.*) 2. To make up a medicine. 3. *To* DISPENSE *with*, to excuse; to grant dispensation for; to allow (*Raleigh*). 4. *To* DISPENSE *with*; to set free from an obligation (*Addison*).

DISPE'NSE. *s.* (from the verb.) Dispensation; exemption: not in use (*Milton*).

DISPE'NSER *s.* (from *dispense.*) One that dispenses; a distributer (*Spratt*).

To DISPE'OPLE. *v. a.* To depopulate; to empty of people (*Pope*).

DISPE'OPLER. *s.* (from *dispeople.*) A depopulator; a waster (*Gay*).

To DISPE'RGE. *v. a.* (*dispergo*, Latin.) To sprinkle; to scatter (*Shakspeare*).

DISPERMOUS, in botany, a term applied to a fructification containing two seeds only, as in umbellate and stellate plants.

To DISPE'RSE. *v. a.* (*dispersus*, Latin.) 1. To scatter, to drive to different parts (*Ez.*). 2. To dissipate (*Milton*). 3. To deal about; to distribute (*Bacon*).

DISPE'RSEDLY. *ad.* (from *dispersed*) In a dispersed manner; separately (*Hooker*).

DISPE'RSEDNESS. *s.* (from *dispersed.*) The state of being dispersed; dispersion.

DISPE'RSENESS. *s.* (from *disperse.*) Thinness; scatteredness (*Brerewood*).

DISPE'RSER. *s.* (from *disperse.*) A scatterer: a spreader (*Spectator*).

DISPERSION, in general, signifies the scattering or dissipating something. Hence, in optics, it denotes the same with the divergency of the rays of light.

DISPERSION (Point of), in dioptrics, the point from which refracted rays begin to diverge where their refraction renders them divergent.

DISPERSION OF INFLAMMATION, in surgery, is the removing an inflammation, and restoring the inflamed part to its natural state.

DISPERSION OF MANKIND, in the history of the world, was occasioned by the confusion of tongues, and took place in consequence of the overthrow of Babel at the birth of Peleg; whence he derived his name. See BABEL and CONFUSION OF TONGUES.

DISPERSION OF LIGHT, in optics, denotes the enlargement of a pencil or beam of light, which is produced by its passage from one medium to another, and this enlargement arises from the nature of the medium.

Dr. Wollaston's mode of examining refractive and dispersive powers is described in Phil. Transac. for 1802, or Nicholson's Jour. vol. iv. pa. 89. Extensive tables of refractive and dispersive powers are given by Dr. T. Young, at pp. 296, 299, vol. ii. of his Natural Philosophy.

To DISPIRIT. *v. a.* (*dis* and *spirit.*) 1. To discourage; to deject; to depress; to damp; to terrify; to intimidate (*Clarendon*). 2. To exhaust the spirits; to oppress the constitution of the body (*Collier*).

DISPI'RITEDNESS. *s.* (from *dispirit.*) Want of vigour; want of vivacity.

To DISPLA'CE. *v. a.* (*dis* and *place.*) 1. To put out of place. 2. To put out of any state or condition (*Bacon*). 3. To disorder (*Shakspeare*).

DISPLA'CENCY. *s.* (*displicentia*, Latin.) 1. Incivility; disobligation. 2. Disgust; any thing unpleasing (*Decay of Piety*).

To DISPLA'NT. *v. a.* (*dis* and *plant.*) 1. To remove a plant. 2. To drive a people from the place in which they have fixed their residence (*Bacon*).

DISPLANTA'TION. *s.* 1. The removal of a plant. 2. The ejection of a people (*Raleigh*).

To DISPLA'Y. *v. a.* (*desployer*, French.) 1. To spread wide (*Spenser*). 2. To exhibit to the sight or mind (*Locke*). 3. To carve; to cut up (*Spectator*). 4. To talk without restraint (*Shakspeare*). 5. To set ostentatiously to view (*Shakspeare*).

DISPLA'Y. *s.* (from the verb.) An exhibition of any thing to view (*Spectator*).

DISPLAYED, in heraldry, an eagle or any other bird so drawn that it stands erect, with its wings expanded.

DISPLEA'SANCE. *s.* (from *displease.*) Anger; discontent: obsolete (*Spenser*).

DISPLEA'SANT. *a.* Unpleasing; offensive; unpleasant (*Glanville*).

To DISPLE'ASE. *v. a.* (*dis* and *please.*) To offend; to make angry (*Chronicles*).

To DISPLE'ASE. *v. n.* To disgust; to raise aversion (*Locke*).

DISPLE'ASINGNESS. *s.* (from *displeasing.*) Offensiveness; quality of offending (*Locke*).

DISPLE'ASURE. *s.* (from *displease.*) 1. Uneasiness; pain received (*Locke*). 2. Offence; pain given (*Judges*). 3. Anger; indignation (*Knolles*). 4. State of disgrace; disfavour (*Peacham*).

To Disple'asure. *v. a.* To displease; not to gain favour: out of use (*Bacon*).

To DISPLODE. *v. a.* (*displodo*, Latin.) To disperse with noise; to vent with violence (*Milton*).

DISPLO'SION. *s.* (from *displosus*, Latin.) The act of disploding; a sudden burst or dispersion with noise and violence.

DISPONDEE, in the Greek and Latin poetry, a double spondee or foot, consisting of four long syllables; as jūrāmēntūm, cōnclūdēntēs, ϑαῡμᾱζοντων.

DISPO'RT. *s.* (*dis* and *sport.*) Play; sport; pastime; diversion (*Hayward*).

To Dispo'rt. *v. a.* To divert (*Shaks.*).

To Dispo'rt. *v. n.* To play; to toy; to wanton (*Pope*).

DISPO'SAL. *s.* (from *dispose.*) 1. The act of disposing or regulating any thing; regulation; distribution (*Milton*). 2. The power of distribution; the right of bestowing (*Atterbury*). 3. Government; management (*Locke*). 4. Establishment in a new state (*Tatler*).

To DISPO'SE. *v. a.* (*disposer*, French.) 1. To employ to various purposes; to diffuse (*Prior*). 2. To give; to place; to bestow (*Spratt*). 3. To turn to any particular end or consesquence (*Dryden*). 4. To adapt; to form for any purpose (*Spenser*). 5. To frame the mind; to incline (*Smalrid*). 6. To make fit (*Locke*). 7. To regulate; to adjust (*Dryden*). 8. *To* Dispose *of*. To apply to any purpose; to transfer to any other person or use (*Swift*). 9. *To* Dispose *of*. To put into the hands of another (*Tatler*). 10. *To* Dispose *of*. To give away (*Waller*). 11. *To* Dispose *of*. To conduct; to behave (*Bacon*). 12. *To* Dispose *of*. To place in any condition (*Dryden*). 13. *To* Dispose *of*. To put away by any means (*Burnet*).

To Dispo'se. *v. n.* To bargain; to make terms: obsolete (*Shakspeare*).

Dispo'se. *s.* (from the verb.) 1. Power; management; disposal (*Shakspeare*). 2 Distribution: act of government (*Milton*). 3. Disposition; cast of behaviour (*Shakspeare*). 4. Cast of mind; inclination (*Shakspeare*).

DISPO'SER. *s.* (from *dispose.*) 1. Distributer; giver; bestower (*Graunt*). 2. Governour; regulator; director (*Boyle*). 3. One who gives to whom he pleases (*Prior*).

DISPOSI'TION. *s.* (from *dispositio*, Lat.) 1. Order; method; distribution (*Dryden*). 2. Natural fitness; quality (*Newton*). 3. Tendency to any act or state (*Bacon*). 4. Temper of mind (*Shakspeare*). 5. Affection of kindness or ill-will (*Swift*). 6. Predominant inclination (*Locke*).

Disposition, in oratory. See Oratory.

Disposition, in painting. See Painting.

Disposition, in human nature. In every man there is something original, that serves to distinguish him from others, that tends to form a character, and to make him meek or fiery, candid or deceitful, resolute or timorous, cheerful or morose. This original bent, termed *disposition*, must be distinguished from a *principle*: the latter, signifying a law of human nature, makes part of the common nature of man; the former makes part of the nature of this or that man. *Propensity* is a term common to both; for it signifies a principle as well as a disposition.

The poets have observed, that men have their "mollia tempora fandi," when they are averse from saying or doing a harsh thing. This disposition is commonly termed by the English "good humour," of which, in the fair sex, Mr. Pope says,

> "Good humour only teaches charms to last,
> "Still makes new conquests, and maintains
> the past."

There is no disposition more comfortable to the person, to the possessor himself, or renders him more agreeable to others, than good humour. It is to the mind what good health is to the body; it gives a man the capacity of enjoying every thing that is agreeable in life, and the faculty of communicating much enjoyment to others.

DISPO'SITIVE. *a.* That implies disposal of any property; decretive (*Ayliffe*).

DISPO'SITIVELY. *ad.* 1. In a dispositive manner. 2. Distributively (*Brown*).

DISPO'SITOR. *s.* The lord of that sign in which the planet is.

To DISPOSSE'SS. *v. a.* To put out of possession; to deprive; to disseize (*Tillotson*).

DISPO'SURE. *s.* (from *dispose.*) 1. Disposal; government; power; management (*Sandys*). 2. State; posture (*Wotton*).

DISPRA'ISE. *s.* Blame; censure (*Addison*).

To Dispra'ise. *v. a.* To blame; to censure; to condemn (*Shakspeare*).

DISPRAI'SER. *s.* A censurer

DISPRA'ISIBLE. *a.* Unworthy of commendation.

DISPRA'ISINGLY. *ad.* With blame (*Shakspeare*).

To DISPRE'AD. *v. a.* (*dis* and *spread.*) To spread different ways (*Pope*).

DISPRO'FIT. *s.* Loss; damage; detriment.

DISPRO'OF. *s.* Confutation; conviction of errour or falsehood (*Atterbury*).

DISPROPO'RTION. *s.* Unsuitableness in form or quantity of one thing to another; want of symmetry; disparity (*Denham*).

To Dispropo'rtion. *v. a.* To mismatch; to join things unsuitable (*Suckling*).

DISPROPO'RTIONABLE. *a.* Unsuitable in form or quantity (*Smalridge*).

DISPROPO'RTIONABLENESS. *s.* Unsuitableness to something else.

DISPROPO'RTIONABLY. *ad.* Unsuitably; not symmetrically (*Tillotson*).

DISPROPO'RTIONAL. *a.* Disproportionably; unsymmetrical; unsuitable.

DISPROPO'RTIONALLY. *ad.* Unsuitably with respect to quantity or value.

DISPROPO'RTIONATE. *a.* Unsymmétrical; unsuitable to something else (*Ray*).

DISPROPO'RTIONATELY. *ad.* Unsuitably; unsymmetrically.

DISPROPO'RTIONATENESS. *s.* Unsuitableness in bulk, form, or value.

To DISPRO'VE. *v. a.* (*dis* and *prove.*) 1. To confute an assertion; to convict of errour or falsehood (*Hooker*). 2. To convict of a practice of errour (*Hooker*). 3. To disapprove; to disallow (*Hooker*).

DISPRO'VER. *s.* (from *disprove.*) 1. One that disproves or confutes. 2. One that blames; a censurer (*Wotton*).

DISPU'NISHABLE. *a.* Without penal restraint (*Swift*).

DISPU'TABLE. *a.* (from *dispute.*) 1. Liable to contest; controvertible (*South*). 2. Lawful to be contested (*Swift*).

DI'SPUTANT. *s.* (*disputans*, Latin.) A controvertist; an arguer; a reasoner (*Spectat*).

Di'sputant. *a.* Disputing; engaged in controversy: not in use (*Milton*).

DISPUTA'TION. *s.* (from *disputatio*, Latin.) 1. The skill of controversy; argumentation. 2. Controversy; argumental contest (*Sidney*).

DISPUTA'TIOUS. *a.* (from *dispute.*) Inclined to dispute; cavilling (*Addison*).

DISPU'TATIVE, *a.* (from *dispute.*) Disposed to debate (*Watts*).

To DISPU'TE. *v. n.* (*disputo*, Latin.) To contend by argument; to altercate; to debate; to controvert (*Tillotson*).

To Dispu'te. *v. a.* 1. To contend for (*Hooker*). 2. To question; to reason about (*Dryden*). 3. To discuss; to think on (*Shakspeare*).

Dispu'te. *s.* Contest; controversy (*Bentley*).

DISPU'TELESS. *a.* Undisputed; uncontrovertible.

DISPU'TER. *s.* A controvertist; one given to argument and opposition (*Stillingfleet*).

DISQUALIFICA'TION. *s.* That which disqualifies; that which makes unfit (*Spectator*).

To DISQUA'LIFY. *v. a.* (*dis* and *qualify.*) 1. To make unfit; to disable by some natural or legal impediment (*Swift*). 2. To deprive of a right or claim by some positive restriction; to disable (*Swift*).

To DISQUA'NTITY. *v. a.* To lessen (*Shakspeare*).

DISQUI'ET. *s.* Uneasiness; restlessness; vexation; anxiety (*Tillotson*).

Disqui'et. *a.* Uneasy; restless (*Shakspeare*).

To Disqui'et. *v. a.* To disturb; to make uneasy; to fret; to vex (*Roscommon*).

DISQUI'ETER. *s.* A disturber; a harasser.

DISQUI'ETLY. *ad.* Without rest; anxiously; uneasily; without calmness (*Shakspeare*).

DISQUI'ETNESS. *s.* Uneasiness; restlessness; anxiety; disturbance (*Hooker*).

DISQUI'ETUDE. *s.* Uneasiness; anxiety; disturbance; want of tranquillity (*Addison*).

DISQUISI'TION. *s.* (*disquisitio*, Latin.) Examination; disputative inquiry (*Arbuthnot*).

To DISRA'NK. *v. a.* To degrade from his rank.

DISREGA'RD *s.* Slight notice; neglect.

To Disrega'rd. *v. a.* To slight; to neglect; to contemn (*Smalridge*).

DISREGA'RDFUL. *a.* Negligent; contemptuous.

DISREGA'RDFULLY. *ad.* Contemptuously.

DISRE'LISH. *s.* (*dis* and *relish.*) 1. Bad taste; nauseousness (*Milton*). 2. Dislike; squeamishness (*Locke*).

To Disre'lish. *v. a.* 1. To infect with an unpleasant taste (*Rogers*). 2. To want a taste of; to dislike (*Pope*).

DISREPUTA'TION. *s.* (*dis* and *reputation.*) 1. Disgrace; dishonour (*Bacon*). 2. Loss of reputation; ignominy (*Taylor*).

DISREPU'TE. *s.* (*dis* and *repute.*) Ill character; dishonour; want of reputation (*South*).

DISRESPE'CT. *s.* (*dis* and *respect.*) Incivility; want of reverence (*Clarendon*).

DISRESPE'CTFUL. *a.* Irreverent; uncivil.

DISRESPE'CTFULLY. *ad.* Irreverently. (*Addison*).

To DISRO'BE. *v. a.* To undress; to uncover; to strip (*Wotton*).

DISRU'PTION. *s.* (*disruptio*, Latin.) 1. The act of breaking asunder (*Ray*). 2. Breach; rent; dilaceration (*Woodward*).

DISS, a town in Norfolk, with a market on Friday. Here are manufactures of sailcloth, linen cloth, hose, and stays. Lat. 52. 25 N. Lon. 1. 9 E.

DISSATISFA'CTION. *s.* The state of being dissatisfied; discontent (*Rogers*).

DISSATISFA'CTORINESS. *s.* Inability to give content.

DISSATISFA'CTORY. *a.* Unable to give content.

To DISSA'TISFY. *v. a.* (*dis* and *satisfy.*) 1. To discontent; to displease (*Collier*). 2. To fail to please (*Locke*).

To DISSE'CT. *v. a.* (*disseco*, Latin.) 1. To cut in pieces (*Roscommon*). 2. To divide and examine minutely (*Atterbury*).

Dissect. In botany, applied to the leaf, Lanciniate or Gashed. See these terms. The gashed leaf however is distinguished from the lanciniate, by the sections being determinate in the first, and indeterminate in the second.

DISSE'CTION. *s.* (*dissectio*, Latin.) 1. The act of separating the parts of animal bodies; anatomy (*Addison*). 2. Nice examination (*Granville*). 3. The cutting to pieces of any part of an animal or vegetable, for the purpose of examining its structure.

To DISSE'IZE. *v. a.* (*dissaiser*, French.) To dispossess; to deprive (*Locke*).

DISSE'ISIN. *s.* (from *dissaisir*, French.) An unlawful dispossessing a man of his right. (*Cowell*).

DISSE'IZOR. *s.* (from *disseize.*) He that dispossesses another.

To DISSE'MBLE. *v. a.* (*dissimulo*, Latin.) 1. To hide under false appearances; to pretend that not to be which really is (*Hayward*). 2. To pretend that to be which is not (*Prior*).

To DISSE'MBLE. *v. n.* To play the hypocrite; to use false professions; to wheedle (*Rowe*).

DISSE'MBLER. *s.* A hypocrite; a man who conceals his true disposition (*Raleigh*).

DISSE'MBLINGLY. *ad.* With dissimulation; hypocritically (*Knolles*).

To DISSE'MINATE. *v. a.* (*dessemino*, Latin.) To scatter as seed; to spread every way (*Atterbury*).

DISSEMINA'TION. *s.* (*disseminatio*, Lat.) The act of scattering like seed (*Brown*).

It has been long a prevailing opinion, among philosophers, that the electic fluid is universally disseminated, and in continual action. To prove this to others, various instruments have been contrived to detect the smallest variations and discover the minutest signs of its existence. See ELECTROMETER.

DISSEMINA'TOR. *s.* He that scatters; he that propagates a doctrine or opinion.

DISSE'NSION. *s.* (*dissensio*, Latin.) Disagreement; strife; contention; quarrel (*Knolles*).

DISSE'NSIOUS. *a.* Disposed to discord; contentious; quarrelsome (*Ascham*).

To DISSE'NT. *v. n.* (*dissentio*, Latin.) 1. To disagree in opinion (*Addison*). 2. To differ; to be of a contrary nature (*Hooker*).

DISSE'NT. *s.* (from the verb.) 1. Disagreement; difference of opinion (*Bentley*). 2. Contrariety of nature: not used (*Bacon*).

DISSENTA'NEOUS. *a.* (from *dissent*.) Disagreeable; inconsistent; contrary.

DISSE'NTER. *s.* (from *dissent*.) 1. One that disagrees, or declares his disagreement, from an opinion (*Locke*). 2. One who, for whatever reason, refuses the communion of the English church.

DISSENTERS, in church history, are a numerous body of people in this country, who made their appearance in queen Elizabeth's time, when, on account of the extraordinary purity, which they proposed in religious worship and conduct, they were reproached with the name of puritans. They increased in numbers by reason of the act of uniformity, which took place on Bartholemew's day 1682, in the reign of Charles II. By this act 2000 ministers of the establishment, refusing to conform to certain conditions, with which they could not conscientiously comply (see BARTHOLEMEW'S DAY), were obliged to quit their livings, and hence arose the name of non-conformists. The descendants of these are known by the name of protestant dissenters: they may be considered in general as divided into the denominations of PRESBYTERIANS, INDEPENDENTS, and BAPTISTS, which see.

The principles on which dissenters separate from the church of England, are the same with those on which the latter separates herself from the church of Rome; these are the right of private judgment; liberty of conscience; and the perfection of scripture as a christian's only rule of faith and practice. (See NONCONFORMISTS.) These principles are defended at length, by Watts, Neal, Palmer, Towgood, Flower, and some other writers. A History of the Dissenters was published some time ago by Mr. Cornish, and a much more extensive one is just published in 4 vols. octavo, by Messrs. Bogue and Bennett.

DISSEPIMENT, in botany, PARTITION, which see.

DISSERTA'TION. *s.* (*dissertatio*, Latin.) A discourse; a disquisition; a treatise (*Pope*).

To DISSE'RVE. *v. a.* (*dis* and *serve*.) To do injury to; to mischief; to harm (*Clarendon*).

DISSE'RVICE. *s.* (*dis* and *service*.) Injury; mischief; ill turn (*Collier*).

DISSE'RVICEABLE. *a.* Injurious; mischievous; hurtful.

DISSE'RVICEABLENESS. *s.* Injury; harm; hurt; mischief; damage (*Norris*).

To DISSE'TTLE. *v. a.* To unsettle; to unfix.

To DISSE'VER. *v. a.* To sever; to part in two; to divide; to separate: a barbarous word (*Raleigh*).

DI'SSIDENCE. *s.* (*dissideo*, Latin.) Discord; disagreement.

DISSI'LIENCE. *s.* (*dissilio*, Lat.) The act of starting asunder.

DISSI'LIENT. In botany, a bursting or elastic pericarp or fruit. Bursting open with a spring; as in hura, dentaria, cardamine, momordica elaterium.

DISSILI'TION. *s.* (*dissilio*, Latin.) The act of bursting in two (*Boyle*).

DISSI'MILAR. *a.* (*dis* and *similar*.) Unlike; heterogeneous (*Newton*).

DISSIMILA'RITY. *s.* (from *dissimilar*.) Unlikeness; dissimilitude (*Cheyne*).

DISSIMI'LITUDE. *s.* (*dissimilitudo*, Lat.) Unlikeness; want of resemblance (*Pope*).

DISSIMULATION. *s.* (*dissimulatio*, Lat.) The act of dissembling; hypocrisy (*South*).

Lord Chesterfield, in his 151st letter to his son, quotes from lord Bacon the distinction between *simulation* and *dissimulation*; "the last of which is only to hide a man's own cards, whereas *simulation* is put on in order to look into other people's." Does not the following account of his own management, which he recommends to his son as an example, come under the description of *simulation?* "I should desire nothing better in any negociation, than to have to do with one of these men of warm, quick passions; which I would take care to set in motion. By artful provocations I would extort rash unguarded expressions; and, by hinting at all the several things I could suspect, infallibly discover the true one, by the alteration it occasioned in the countenance of the person." Is not this to look into another man's cards? We pretend not to determine whether this be proper and able conduct, in a negociator; but in a man it is surely detestable.

DI'SSIPABLE. *a.* (from *dissipate*.) Easily scattered; liable to dispersion (*Bacon*).

To DI'SSIPATE. *v. a.* (*dissipatus*, Latin.) 1. To scatter every way; to disperse (*Wood-*

ward). 2. To scatter the attention (*Savage's Life*). 3. To spend a fortune (*London*).

DISSIPATION. *s.* (*dissipatio*, Latin.) 1. The act of dispersion (*Hale*). 2. The state of being dispersed (*Milton*). 3. Scattered attention (*Swift*).

Dissipation, in physics, an insensible loss or consumption of the minute parts of the body; or that mode whereby they fly off, and are lost.

Dissipation (Circle of), in optics, denotes that circular space upon the retina, which is taken up by one of the extreme pencils or rays issuing from an object.

To DISSO'CIATE. *v. a.* (*dissocio*, Latin.) To separate; to disunite; to part (*Boyle*).

DISSO'LVABLE. *a.* (from *dissolve.*) Capable of dissolution; liable to be melted (*Newton*).

DI'SSOLUBLE. *a.* (*dissolubilis*, Lat.) Capable of separation (*Woodward*).

DISSOLUBI'LITY. *s.* (from *dissoluble.*) Liableness to suffer a disunion of parts (*Hale*).

To DISSO'LVE. *v. a.* (*dissolvo*, Latin.) 1. To destroy the form of any thing by disuniting the parts with heat or moisture; to melt; to liquefy (*Woodward*). 2. To break; to disunite (*Peter*). 3. To loose; to break the ties of any thing (*Milton*). 4. To separate persons united (*Shakspeare*). 5. To break up assemblies (*Bacon*). 6. To solve; to clear (*Dan.*). 7. To break an enchantment (*Milton*). 8. To be relaxed by pleasure (*Dryden*).

To Disso'lve. *v. n.* 1. To be melted; to be liquefied (*Addison*). 2. To fall to nothing (*Shakspeare*). 3. To melt away in pleasure.

DISSO'LVENT. *a.* (from *dissolve.*) Having the power of dissolving or melting (*Ray*).

Disso'lvent. Disso'lver. *s.* That which has the power of disuniting the parts of any thing (*Arbuthnot*).

DISSO'LVIBLE. *a.* (from *dissolve.*) Liable to perish by dissolution (*Hale*).

DI'SSOLUTE. *a.* (*dissolutus*, Lat.) Loose; wanton; unrestrained; luxurious; debauched; dissolved in pleasures (*Rogers*).

DI'SSOLUTELY. *ad.* Loosely; in debauchery; without restraint (*Wisdom*).

DI'SSOLUTENESS. *s.* Looseness; laxity of manners; debauchery (*Locke*).

DISSOLU'TION. *s.* (*dissolutio*, Latin.) 1. The act of liquefying by heat or moisture. 2. The state of being liquefied. 3. The state of melting away (*Shakspeare*). 4. Destruction of any thing by the separation of its parts (*South*). 5. The substance formed by dissolving any body (*Bacon*). 6. Death; the resolution of the body into its constituent elements (*Raleigh*). 7. Destruction (*Hooker*). 8. Breach of any thing compacted (*South*). 9. The act of breaking up an assembly. 10. Looseness of manners (*Atterbury*).

Dissolution, in chemistry, the solution of a substance, accompanied with the decomposition of its elementary principles, or at least a general change in its nature. Of lime we may obtain a solution in muriatic acid, of chalk a dissolution in the same liquid. Dissolution is, therefore, properly a species of what is comprised in the generic term decomposition.

DI'SSONANCE. *s.* (*dissonance*, French.) A mixture of harsh, unharmonious sounds (*Milton*). (See Discord.)

DI'SSONANT. *a.* (*dissonans*, Latin.) 1. Harsh; unharmonious (*Thomson*). 2. Incongruous; disagreeing (*Hakewill*).

To DISSUA'DE. *v. n.* (*dissuadeo*, Latin.) 1. To dehort; to divert by reason or importunity from any thing (*Shakspeare*). 2. To represent any thing as unfit (*Milton*).

DISSUA'DER. *s.* He that dissuades.

DISSUA'SION. *s.* (*dissuasio*, Latin.) Urgency of reason or importunity against any thing; dehortation (*Boyle*).

DISSUA'SIVE. *a* (from *dissuade.*) Dehortatory; tending to divert from any purpose.

Dissua'sive. *s.* Dehortation; argument to turn the mind off from any pursuit.

DISSY'LLABLE. *s.* (δισσυλλαβος.) A word of two syllables (*Dryden*).

DI'STAFF. *s.* (diſtæf, Saxon.) 1. The staff from which the flax is drawn in spinning (*Fairfax*). 2. It is used as an emblem of the female sex.

Distaff thistle, in botany. See Carthamus.

To DISTA'IN. *v. a.* (*dis* and *stain.*) 1. To stain; to tinge (*Pope*). 2. To blot; to sully with infamy (*Spenser*).

DI'STANCE. *s.* (*distance*, Fr. *distantia*, Latin.) 1. Space considered barely in length between any two beings (*Locke*). 2. Remoteness in place (*Prior*). 3. The space kept between two antagonists in fencing (*Shakspeare*). 4. Contrariety; opposition (*Shakspeare*). 5. A space marked on the course where horses run (*L'Estrange*). 6. Space of time (*Prior*). 7. Remoteness in time (*Smalridge*). 8. Ideal disjunction; mental separation (*Locke*). 9. Respect; distant behaviour (*Dryden*). 10. Retraction of kindness; reserve (*Milton*).

Distance, in astronomy. The real distances of the sun, planets, and comets, are found from their parallaxes. (See Parallax.) Or, with respect to the planets, as the distance of the earth from the sun has been found by transits of Venus, to be 95 millions of miles; from this one real distance and the periodic times of the planets, the respective real distances of the whole may be found by means of Kepler's second law. For the relative, as well as real distances of the planets from the sun (see Astronomy). As to the distances of the fixed stars, since they have no sensible parallax, all that we could say on this subject would be little else than guessing.

Curtate Distance. See Curtate.

Accessible Distances, in geometry, are measured with the chain, decempeda or ten-foot rod, or the like.

Inaccessible Distances, are found by taking bearings to them, from the two extremities of a line whose length is given. Various ways of performing this may be seen in Hutton's Mensuration, Bonnycastle's Trigonometry, and most other books on the latter subject.

Distance of the bastions, in fortification, the side of the exterior polygon. See Polygon.

Apparent Distance, in optics, that distance which we judge an object is placed at when seen afar off, being usually very different from the true distance; because we are apt to think that all very remote objects, whose parts cannot well be distinguished, and which have no other object in view near them, are at the same distance from us, though perhaps the one is thousands of miles nearer than the other, as is the case with regard to the sun and moon.

M. De la Hire enumerates five circumstances, which assist us in judging of the distance of objects; viz. their apparent magnitude, the strength of the colouring, the direction of the two eyes, the parallax of the objects, and the distinctness of their small parts. On the contrary, Dr. Smith maintains, that we judge of distance principally, or solely, by the apparent magnitude of objects; and concludes universally, that the apparent distance of an object seen in a glass, is to its apparent distance seen by the naked eye, as the apparent magnitude to the naked eye is to its apparent magnitude in the glass: but it was long since observed by Alhazen, that we do not judge of distance merely by the angle under which objects are seen; and Mr. Robins clearly shews that Dr. Smith's hypothesis is contrary to fact, in the most common and simple cases. Thus, if a double convex glass be held upright before some luminous object, as a candle, there will be seen two images, one erect, and the other inverted; the first is made simply by reflexion from the nearest surface; the second by reflexion from the farther surface, the rays undergoing a refraction from the first surface both before and after the reflexion. If this glass has not too short a focal distance, when it is held near the object, the inverted image will appear larger than the other, and also nearer; but if the glass be carried off from the object, though the eye remain as near to it as before, the inverted image will be diminished so much faster than the other, that at length it will appear much less than it, but still nearer. Here, says Mr. Robins, two images of the same object are seen under one view, and their apparent distances immediately compared; and it is evident that those distances have no necessary connexion with the apparent magnitude. This experiment may be made still more convincing, by sticking a piece of paper on the middle of the lens, and viewing it through a short tube. He observes farther, that the apparent magnitude of very distant objects is neither determined by the magnitude of the angle only under which they are seen, nor is the exact proportion of that angle compared with their true distance, but is compounded also with a deception concerning that distance; so that if we had no idea of difference in the distance of objects, each would appear in magnitude proportional to the angle under which it was seen; and if our apprehension of the distance were always just, our idea of their magnitude would be unvaried, in all distances; but in proportion as we err in our conception of their distance, the greater angle suggests a greater magnitude. By not attending to this compound effect, Mr. Robins apprehends that Dr. Smith was led into his mistake.

Dr. Porterfield gives a distinct and comprehensive view of the natural methods of judging concerning the distance of objects.

The conformation of the eye, he observes, can be of no use to us with respect to objects that are placed without the limits of distinct vision. As the object, however, does then appear more or less confused, according as it is more or less removed from those limits, this confusion assists the mind in judging of the distance of the object; it being always esteemed so much the nearer, or the farther off, by how much the confusion is greater. But this confusion hath its limits also, beyond which it can never extend; for when an object is placed at a certain distance from the eye, to which the breadth of the pupil bears no sensible proportion, the rays of light that come from a point in the object, and pass the pupil, are so little diverging, that they may be considered as parallel. For a picture on the retina will not be sensibly more confused, though the object be removed to a much greater distance.

The most universal, and frequently the most sure, means of judging of the distance of objects is, he says, the angle made by the optic axis. For our two eyes are like two different stations, by the assistance of which distances are taken; and this is the reason why those persons who are blind of one eye so frequently miss their mark in pouring liquor into a glass, snuffing a candle, and such other actions as require that the distance be exactly distinguished. To convince ourselves of the usefulness of this method of judging of the distance of objects, he directs us to suspend a ring in a thread, so that its side may be towards us, and the hole in it to the right and left hand; and taking a small rod, crooked at the end, retire from the ring two or three paces, and having with one hand covered one of our eyes, to endeavour with the other to pass the crooked end of the rod through the ring. This, says he, appears very easy; and yet, upon trial, perhaps once in 100 times we shall not succeed, especially if we move the rod a little quickly.

Our author observes, that, by persons recollecting the time when they began to be subject to the mistakes above-mentioned, they may tell when it was that they lost the use of one of their eyes; which many persons are long ignorant of, and which may be a circumstance of some consequence to a surgeon. The use of this second method of judging of distances De Chales limited to 120 feet; beyond which, he says, we are not sensible of any difference in the angle of the optic axis.

A third method of judging of the distance of objects consists in their apparent magnitudes, on which so much stress was laid by Dr. Smith. From this change in the magnitude of the image upon the retina we easily judge of the distance of objects, as often as we are otherwise acquainted with the magnitude of the objects themselves; but as often as we are ignorant of the real magnitude of bodies, we can never, from their apparent magnitude, form any judgment of their distance.

From this we may see why we are so frequently deceived in our estimates of distance, by any extraordinare magnitudes of objects seen at the end of it; as, in travelling towards a large city, or a castle, or a cathedral church, or a mountain larger than ordinary, we fancy them to be nearer than we find them to be. This also is the reason why animals, and all small objects, seen in valleys contiguous to large mountains, appear exceedingly small. For we think the mountain nearer to us than if it were smaller; and we should not be surprised at the smallness of the neighbouring animals, if we thought them farther off. For the same reason, we think them exceedingly small, when they are placed upon the top of a mountain, or a large building; which appear nearer to us than they really are, on account of their extraordinary size.

Dr. Jurin clearly accounts for our imagining objects, when seen from a high building, to be smaller than they are, and smaller than we fancy them to be when we view them at the same distance on level ground. It is, says he, because we have no distinct idea of distance in that direction, and therefore judge of the things by their pictures upon the eye only; but custom will enable us to judge rightly even in this case.

Let a boy, says he, who has never been upon any high building, go to the top of the Monument, and look down into the street; the objects seen there, as men and horses, will appear so small as greatly to surprise him. But 10 to 20 years after, if in the mean time he has used himself now and then to look down from that and other great heights, he will no longer find the same objects to appear so small. And if he were to view the same objects from such heights as frequently as he sees them upon the same level with himself in the streets, he supposes that they would appear to him just of the same magnitude from the top of the Monument as they do from a window one story high. For this reason it is, that statues placed upon very high buildings ought to be made of a larger size than those which are seen at a nearer distance; because all persons, except architects, are apt to imagine the height of such buildings to be much less than it really is.

The fourth method by which Dr. Porterfield says that we judge of the distance of objects, is the force with which their colour strikes upon our eyes. For if we be assured that two objects are of a similar and like colour, and that one appears more bright and lively than the other, we judge that the brighter object is the nearer of the two.

The fifth method consists in the different appearance of the small parts of objects. When these parts appear distinct, we judge that the object is near, but when they appear confused, or when they do not appear at all, we judge that it is at a greater distance. For the image of any object, or part of an object, diminishes as the distance of it increases.

The sixth and last method by which we judge of the distance of objects is, that the eye does not represent to our mind one object alone, but at the same time all those that are placed betwixt us and the principal object, whose distance we are considering; and the more this distance is divided into separate and distinct parts, the greater it appears to be. For this reason, distances upon uneven surfaces appear less than upon a plane: for the inequalities of the surfaces, such as hills, and holes, and rivers, that lie low and out of sight, either do not appear, or hinder the parts that lie behind them from appearing; and so the whole apparent distance is diminished by the parts that do not appear in it. This is the reason that the banks of a river appear contiguous to a distant eye, when the river is low and not seen.

Dr. Porterfield very well explains several fallacies in vision depending upon our mistaking the distances of objects. Of this kind, he says, is the appearance of parallel lines, and long vistas consisting of parallel rows of trees; for they seem to converge more and more as they are farther extended from the eye. The reason of this, he says, is because the apparent magnitudes of their perpendicular intervals are perpetually diminishing, while, at the same time, we mistake their distance. Hence we may see why, when two parallel rows of trees stand upon an ascent, whereby the more remote parts appear farther off than they really are, because the line that measures the length of the vistas now appears under a greater angle than when it was horizontal, the trees, in such a case, will seem to converge less, and sometimes, instead of converging, they will be thought to diverge.

For the same reason that a long vista appears to converge more and more the farther it is extended from the eye, the remoter parts of a horizontal walk or a long floor will appear to ascend gradually; and objects placed upon it, the more remote they are, the higher they will appear, till the last be seen on a level with the eye; whereas the ceiling of a long gallery appears to descend towards a horizontal line, drawn from the eye of the spectator. For this reason also, the surface of the sea, seen from an eminence, seems to rise higher and higher the farther we look; and the upper parts of high buildings seem to stoop, or incline forwards over the eye below, because they seem to approach towards a vertical line proceeding from the spectator's eye; so that statues on the top of such buildings, in order to appear upright, must recline or lean backwards a little.

This author also shews the reason why a windmill, seen from a great distance, is sometimes imagined to turn the contrary way from what it really does, by our taking the nearer end of the sail for the more remote. The uncertainty we sometimes find in the course of the motion of a branch of lighted candles, turned round at a distance, is owing to the same cause; as also our sometimes mistaking a convex for a concave surface, more especially in viewing seals and impressions with a convex glass or a double microscope; and lastly, that, upon coming in a dark night into a street, in which there is but one row of lamps, we often mistake the side of the street they are on. Some important reflections are made upon this curious subject by M. Bouguer, also by Mr. Harris in his Optics, and by Dr. Young and M. Hauy in their respective Courses of Natural Philosophy.

Distance of the eye, in perspective, is a line drawn from the eye to the principal point.

Point of Distance, in perspective, a point in the horizontal line at such distance from the principal point, as is that of the eye from the same.

Distance, as applied to the turf, is a length of two hundred and forty yards from the winning-post of a race-course; precisely at which spot is fixed a post corresponding with others, but having a gallery capable of holding three or four persons, which is called the distance post. In this gallery as well as in the gallery of the winning-post, before the horses start each heat, a person is stationed holding a crimson flag; during the time the horses are running, each flag is suspended from the front of the gallery to which it belongs; and the flag is inclined forwards as a horse passes either post. Now, if there be any horse which has not come up to the distance post, before the first horse in that heat has reached the winning post, as manifested by the motion of the flag, such horse is said to be distanced, and is incapable of running any more during that race.

To DISTANCE. *v. a.* (from the noun.) 1. To place remotely; to throw off from the view (*Dryden*). 2. To leave behind at a race the length of a distance (*Gay*).

DI'STANT. *a.* (*distans*, Latin.) 1. Remote in place; not near (*Pope*). 2. Remote in time either past or future. 3. Remote to a certain degree. 4. Reserved; shy. 5. Remote in nature; not allied (*G. of Tongue.*) 6. Not obvious; not plain (*Addison*).

Distant, in botany, a term applied to the whorl, when the flowers which compose it, being few in number, are remote from each other. It is applied also to stamens (stamina distantia), as in mint.

DISTA'STE. *s.* (*dis* and *taste.*) 1. Aversion of the palate; disgust (*Bacon*). 2. Dislike; uneasiness (*Bacon*) 3. Anger; alienation of affection (*Pope*).

To Dista'ste. *v. a.* 1. To fill the mouth with nauseousness (*Shakspeare*). 2. To dislike; to loathe (*Shakspeare*). 3. To offend; to disgust (*Davies*). 4. To vex; to exasperate; to sour (*Pope*).

DISTA'STEFUL. *a.* 1. Nauseous to the palate; disgusting (*Glanville*). 2. Offensive; unpleasing (*Davies*). 3. Malignant; malevolent (*Brown*).

DISTE'MPER. *s.* (*dis* and *temper.*) 1. A disproportionate mixture of parts. 2. A disease; a malady (*Suckling*). 3. Want of due temperature (*Raleigh*). 4. Bad constitution of the mind (*Shakspeare*). 5. Want of due balance between contraries (*Bacon*). 6. Depravity of inclination (*K. Charles*). 7. Tumultuous disorder (*Waller*) 8. Disorder; uneasiness (*Shakspeare*).

To Diste'mper. *v a.* 1. To disease (*Shakspeare*). 2. To disorder (*Boyle*). 3. To disturb; to ruffle (*Dryden*). 4. To destroy temper or moderation (*Addison*). 5. To make disaffected (*Shakspeare*).

DISTE'MPERATE. *a.* Immoderate (*Ral.*).

DISTE'MPERATURE. *s.* 1. Intemperateness; excess of heat or cold, or other qualities (*Abbot*). 2. Violent tumultuousness; outrageousness. 3. Perturbation of the mind (*Shakspeare*). 4. Confusion; loss of regularity (*Shakspeare*)

To DISTE'ND. *v. a.* (*distendo*, Latin.) To stretch out in breadth (*Thomson*).

DISTE'NT. *s.* (from *distend.*) The space through which any thing is spread (*Wotton*).

DISTE'NTION. *s.* (*distentio*, Latin.) 1. The act of stretching; state of things stretched (*Arbuthnot*). 2. Breadth; space occupied by the thing distended. 3. The act of separating one part from another; divarication (*Wotton*).

To DISTHRONI'ZE. *v. a.* (*dis* and *throne.*) To dethrone: not used (*Spenser*).

DISTICH, Διϛιχον, a couplet of verses; or a piece of poetry, the sense whereof is comprehended in two lines. There are excellent morals in Cato's Distichs. See Vigneul de Marville on the Distichs of Cato, tom. i. p. 54, 55.

Hexameter and pentameter verses, otherwise called elegiacs, are disposed in distichs.

DISTICHIASIS. (*distichiasis*, διϛιχιασις; from διστιχια, from δις, double, and ϛιχος, row.) A disease of the eyelash, in which there is a double row of hairs, the one row growing outwards, the other inwards towards the eye.

DISTICHOUS. In botany. (δις, and στιχος, row or rank.) Two-ranked. Distichus caulis; ramos situ horizontali, nec decussatim sitos exserens. A distich or two-ranked stem or stalk: putting forth branches, not decussated, but in a horizontal position. Disticha folia: duo latera rami tantum respicientia, licet undique inserta. Respecting two sides of the branch only, though inserted on all parts of it: as in fir and diervilla. Or, pointing two ways only, though not in the same plane.

This term is applied in the same sense to a spike (spica disticha); floribus ad utrumque latus spectantibus; all the flowers pointing two ways.

To DISTI'L. *v. n.* (*distillo*, Latin.) 1. To drop; to fall by drops (*Pope*). 2. To flow gently and silently (*Raleigh*). 3. To use a still (*Shakspeare*).

To Disti'l. *v. a.* 1. To let fall in drops (*Drayton*). 2. To force by fire through the vessels of distillation (*Shakspeare*). 3. To draw by distillation (*Boyle*). 4. To dissolve or melt (*Addison*).

DISTILLA'TION. *s.* (*distillatio*, Latin.) 1. The act of dropping, or falling in drops. 2. The act of pouring out in drops. 3. That which falls in drops. 4. The act of distilling by fire (*Newton*). 5. The substance drawn by the still (*Shakspeare*).

Distillation. (*distillatio*, from *distillo*, to drop by little and little.) A chemical process, very similar to evaporation, instituted to separate the volatile from the fixed principles by means of heat. Distillatory vessels are either alembics or retorts; the former consist of an inferior vessel, called a cucurbit, designed to contain the matter to be examined, and having an upper part fixed to it, called the capital or head. In this last the vapours are condensed by the contact of the surrounding air, or, in other cases, by the assistance of cold water surrounding the head, and contained in a vessel called a refrigeratory From the lower part of the capital proceeds a tube, called the nose, beak, or spout, through which the vapours, after condensation, are, by a proper figure of the capital, made to flow into a vessel called the receiver, which is usually spherical. These receivers have different names, according to their figure, being called mattrasses, balloons, &c. Retorts are a kind of bottle of glass, pottery, or metal, the bottom being spherical, and the upper part gradually diminishing into a neck, which is turned on one side.

But the greatest improvement which the process of distillation has perhaps ever received consists in the comparatively modern addition of a separate series of tubes and vessels to convey and collect the gaseous products of substances submitted to the operation, and to avoid all the danger from sudden expansion, without the necessity of letting off to waste a large portion of the difficultly condensible, but frequently most important products of the operation.

This part of the machinery, from the name of its inventor, is denominated Woulfe's apparatus. Something of the same kind, however, was invented by Glauber as early as the year 1655; who, aware of the numerous defects of the common apparatus, substituted to the series of perpendicular aludel-shaped receivers, a lateral series of plain stone or earthen jars, each connected with the other by earthen tubes bent at right angles, and the covers of each jar having two holes, one to receive the tube bringing the vapour from the adjoining jar or the retort, and the other for the passage of the tube which conveyed the excess of this vapour into the next in succession. The chief improvement upon this machinery in Woulfe's apparatus consists in filling the lateral vessels with water, into which the inventor dips the extremity of each tube, bringing into it the uncondensed part of the vapour, by which a vast quantity of product is saved.

The practical uses of distillation in chemistry are too numerous to be mentioned. By it the volatile part of any substance is separated from that which is fixed, as in the distillation of turpentine, in which the essential oil rises and the rosin is left behind, the more evaporable is separated from the less evaporable, as in the preparation or rectification of ardent spirit, liquids are freed from foreign or accidental impurities, as in the distillation of common water, volatile substances are united in an easy and commodious manner, as in preparing the odorous distilled waters of aromatic vegetables, bodies are decomposed and analyzed, new compounds are formed, and a knowledge is obtained of the native and chemical properties of foreign substances.

When the products of distillation are solid and dry, the process is usually termed SUBLIMATION, which see.

There are various modes of applying heat in distillation, depending upon the nature of the apparatus employed, as well as upon the substance to be distilled. The common still, being formed of metal, is immediately exposed to the naked fire, since from its tenacity, and its property of conducting heat with facility, it is not liable to crack, which is not the case with glass and earthen ware. If the vessel holding the substance to be distilled be of the latter kind, it is essential to apply the heat very gradually and uniformly, and after the process, to suffer it to cool in a similar manner. This is effected in different ways, the most common of which is the sand bath, which consists of a vessel of iron filled with fine dry sand. The retort, or other vessel, is imbedded in the sand previous to the application of the fire; the inferior conducting power of the sand does not allow the heat to approach the retort, but in that gradual way, which will insure its safety from cracking. The heat must also be more uniform, since any sudden increase, or diminution of the fire, will not so immediately affect the retort.

In experiments in the small way, the lamp will answer every purpose of the sand bath, as the sliding rest containing the retort, admits of its being placed at any given distance from the flame. In addition to this, the Argand lamp can be adjusted by the rack, to almost any degree of intensity below its maximum. Another method of defending the retort from the too rapid effect of the heat, consists in coating the outside with a mixture of horse-dung and clay, or loam. When a limited degree of heat is required in distillation, recourse is had to a bath of some liquid, whose boiling point will give the degree of heat required, such as water, oil, or mercury. If, for instance, it were required to separate any substance from water more volatile than that liquid, it would be necessary to employ a water bath, in which to place the retort, keeping the water in the bath below its boiling point.

Yet the laws of distillation are so modified by other circumstances as to render several of the preceding rules in some degree exceptionable. Thus we frequently find that one volatile substance will carry along with it other bodies of considerable fixity. From the affinity water has to air, an evaporation of the former takes place at all temperatures below its boiling point, and though it has been thought that water might be freed from saline matter by distillation, experiment proves that several salts are carried over, along with the vapour of the water, which, in their dry state, would undergo decomposition before they would be induced to assume the elastic form, whence water by common distillation cannot be rendered pure.

The salts most disposed to rise with water in distillation are carbonat of ammonia, muriats of lime, and magnesia, and nitrat of soda. Indeed this tendency appears to be directly as the solubility of the salt, or rather as its deliquescent property, which is as its affinity for water.

It is chiefly in consequence of the ascent of bodies of greater fixity with certain bodies of greater volatility that there is so much difficulty in our own country of imitating the foreign vinous spirits of other countries, as for example French brandies, and West India rums. All these are individuated by the character of the essential oil that ascends with the spirit, and gives it the peculiar flavour by which one spirit differs from another. Now we can obtain an essential oil from any of the vegetables that furnish these different spirits, but we cannot readily obtain a spirit altogether tasteless, and destitute of some sort of essential oil still combining with it, from whatever substance we distil in our own country. Could we do this we could manufacture to perfection an artificial Coniac brandy or Jamaica rum; but as we cannot altogether separate the inherent essential oil from the purest and most colourless and most insipid spirit we can obtain, when we add the essential oil with which we mean to flavour it, the union of the two oils gives us necessarily a different result, and betrays the artifice to every one who is acquainted with the taste of the genuine material.

In order, then, to prepare the oil of wine, or of the grapes from which French brandies are distilled; which are generally the worst and most unripe that the country affords, the best being selected for the process of wine itself, which pays a far ampler profit; take some cakes of dry wine-lees, such as are used by our hatters, dissolve them in 6 or 8 times their weight of water, distil the liquor with a slow fire, and separate the oil with a separating glass, reserving for only the nicest uses that which comes over first, the succeeding oil being coarser and more resinous. Having procured this fine oil of wine, it may be dissolved in alcohol; by which means it may be preserved a long time fully possessed of all its flavour, but otherwise it will soon grow rancid.

With a fine essential oil of wine thus procured, and a pure and insipid spirit, French brandies may be imitated to some degree of perfection. The essential oil, however, must be drawn from the same kind of lees as the brandy to be imitated was procured from; *e. g.* in order to imitate Coniac brandy, it will be necessary to distil the essential oil from Coniac lees; and the same for any other kind of brandy. For as different brandies have different flavours, and as these flavours are entirely owing to the essential oil of the grape, it would be preposterous to endeavour to imitate the flavour of Coniac brandy with an essential oil procured from the lees of Bourdeaux wine. When the flavour of the brandy is well imitated by a proper dose of the essential oil, and the whole reduced into one simple and homogeneous fluid, other difficulties are still behind: the flavour, though the essential part, is not, however, the only one; the colour, the proof, and the softness, must also be regarded, before a spirit that perfectly resembles brandy can be procured. With regard to the proof, it may be easily accomplished, by using a spirit rectified above proof; which, after being intimately mixed with the essential oil of wine, may be let down to a proper standard with fair water: and the softness may, in a great measure, be obtained by distilling and rectifying the spirit with a gentle fire; and what is wanting of this criterion in the liquor when first made, will be supplied by time: for it must be remembered, that it is time alone that gives this property to French brandies, they being at first acrid, foul, and fiery. But with regard to the colour, a particular method is required to imitate it to perfection, which may be effected by means of treacle or burnt sugar. The treacle gives the spirit a fine colour, nearly resembling that of French brandy; but as its colour is dilute, a large quantity must be used. This is not, however, attended with any bad consequences; for notwithstanding the spirit is really weakened by this addition, yet the bubble-proof, the general criterion of spirits, is greatly mended by the tenacity imparted to the liquor by the treacle. The spirit also acquires from the mixture a sweetish or luscious taste, and a fulness in the mouth; both which properties render it very agreeable to some palates. A much smaller quantity of burnt sugar than of treacle will be sufficient for colouring the same quantity of spirits: the taste is also very different; for, instead of the sweetness imparted by the treacle, the spirit acquires from the burnt sugar an agreeable bitterness, and by that means recommends itself to many who are offended with a luscious spirit. The burnt sugar is prepared by dissolving a proper quantity of sugar in a little water, and scorching it over the fire till it acquires a black colour. Either treacle or burnt sugar will nearly imitate the genuine colour of old French brandy; but neither of them will succeed when put to the test of the vitriolic solution.

The spirit distilled from melasses or treacle is very pure. It is made from common treacle dissolved in water, and fermented in the same manner as the wash for the common malt spirit. But if some particular art be not used in distilling this spirit, it will not prove so vinous as malt spirit, but more flat and less pungent and acrid, though otherwise much cleaner-tasted, as its essential oil is of a much less offensive flavour. Therefore, if good fresh wine-lees, abounding in tartar, be well fermented with melasses, the spirit will acquire a much greater vinosity and briskness, and approach much nearer to the nature of foreign spirits. Where the melasses spirit is brought to the common proof-strength, if it be found not to have a sufficient vinosity, it will be very proper to add some dulcified spirit of nitre; and if the spirit be clean worked, it may, by this addition only, be made to pass on ordinary judges for French brandy. Great quantities of this spirit are used in adulterating foreign brandy, rum, and arrack. Much of it is also used alone in making cherry-brandy and other cordials by infusion; in all which, many, and perhaps with justice, prefer it to foreign brandies. Melasses, like all other spirits, is entirely colourless when first extracted; but distillers always give it it as nearly as possible the colour of foreign spirits.

In this manner we may imitate foreign spirits of all kinds. Thus if Jamaica rum be our object, instead of French brandy, it will only be necessary to procure some of the tops or other useless parts of the sugar-canes, from which an essential oil being drawn and mixed with clear melasses spirit, will give it the true flavour; or at least a flavour as true as a spirit not totally divested of all essential flavour of its own can possibly communicate. The principal difficulty therefore must still lie in procuring a spirit totally, or nearly, free from all flavour of its own. The spirit drawn from the refuse of a sugar-house has been commended as superior to that drawn from melasses; though it is very probable, that to procure an absolutely flavourless spirit is impossible. The only method, therefore, of imitating foreign spirits is, by choosing such materials as will yield a spirit flavoured as much like them as possible; and the materials most recommended, and probably the best that can be used, are raisins.

In the process of obtaining Holland gin, the Dutch distillers first intermix an unequal quantity of malt ground to a meal, and rye; some prefer that the former should predominate, and some that the latter should. Before this intermixture takes place, however, each substance is to be made into a thin batter or lob, first with a very small portion of cold water, and then a larger quantity of boiling water, and then suffered to ferment by the addition of a sufficient quantity of yeast, for the space of about eight and forty hours. The fluid is rendered just dilute enough for the purpose of distillation without endangering its burning to the bottom of the still. By these means they commodiously reduce the processes of brewing and fermenting to one common operation. By using cold water to wet the malt uniformly, all danger of clogging the spending of the tap would be necessarily avoided; but here is no occasion to do any thing more than sufficiently dilute the wash, consisting of the whole of the grain, thin enough to be fermented and distilled together, by which means the spirit of the bran and husky part, as well as of the flour of the grain, are completely extracted, yet their wash, compared with ours, is about three-eighths thinner. For these reasons, they obtain more spirit from their grain than we do, and of a better quality, with not half the trouble taken by our distillers.

To rectify this spirit into Holland-gin, which constitutes the next process, add to every twenty gallons of spirit of the second extraction, about the strength of proof spirit, three pounds of juniper berries, and two ounces of oil of juniper, and distil with a slow fire, till the feints begin to ascend; then change the receiving can. This produces the best Rotterdam-gin. An inferior kind is made with a still less proportion of berries, sweet fennel-seeds, and Strasburg turpentine without a drop of juniper oil. This last, as also a better sort though still inferior to that of Rotterdam, is produced in very large quantities at Welsoppe.

DISTI'LLATORY. *a.* (from *distil.*) Belonging to distillation; used in distillation (*Boyle*).

DISTILLED WATERS. See PHARMACY.

DISTI'LLER. *s.* (from *distil.*) 1. One who practises the art or trade of distilling (*Boyle*). 2. One who makes and sells pernicious and inflammatory spirits.

By stat. 3 Geo. III. c. 5. s. 12, persons who sell liquors chargeable with duty, and distil spirits, are deemed common distillers, and are liable to surveys, penalties, &c. See EXCISE.

DISTI'LMENT. *s.* (from *distil.*) That which is drawn by distillation: obsolete (*Shakspeare*).

DISTI'NCT. *a.* (*distinctus*, Latin.) 1. Different; not the same (*Stillingfleet*). 2. Separate; being apart (*Tillotson*). 3. Clear; unconfused (*Milton*). 4. Spotted; variegated (*Milton*). 5. Marked out; specified (*Milton*).

DISTINCT LEAVES, in botany. Folia distincta. Quite separate from each other. Contrasted with connate: as *in* several of the mesembryanthema. Distinct leaflets, as in jasminum officinale; contrasted with confluent, as in j. grandiflorum. Distinct or separate anthers, as in most flowers; contrasted with connate.

DISTI'NCTION. *s.* (*distinctio*, Latin.) 1. The act of discerning one as preferable to the other (*Shakspeare*). 2. Note of difference. 3. Honourable note of superiority. 4. That by which one differs from another (*Locke*). 5. Difference regarded (*Dryden*). 6. Separation of complex notions (*Shakspeare*). 7. Division into different parts (*Dryden*). 8. Notation of difference between things seemingly the same; discrimination (*Norris*). Discernment, judgment.

DISTINCTION, in logic, is an assemblage of two or more words, whereby disparate things, or their conceptions, are denoted.

There are three kinds of distinctions, taken from the three different modes of existence, real, modal, and rational. The first is that between two substances, or the modes of two substances. The second, or modal distinction, is that between several things, one whereof may exist without the other, but not vice versa, the other without that. The third, or rational distinction, is that between several things which are really one and the same, and whereof one cannot exist without the other; nor vice versa, the other without this: such is that between a thing and its essence, between the essences and properties, &c. Of this distinction some authors admit two kinds: the one barbarously called rationis ratiocinatæ, having some foundation in things, as when we distinguish the justice of God from his mercy; the other called rationis raticionantis, which has no foundation at all, and therefore is by many rejected. (*Chauvin.*)

DISTI'NCTIVE. *a.* (from *distinct.*) 1. That marks distinction or difference (*Pope*). 2. Having the power to distinguish and discern; judicious (*Brown*).

DISTI'NCTIVELY. *ad.* Particularly; not confusedly (*Shakspeare*).

DISTI'NCTLY. *ad.* (from *distinct.*) 1. Not confusedly (*Newton*). 2. Plainly; clearly (*Dryden*).

DISTI'NCTNESS. *s.* (from *distinct.*) 1. Nice observation of the difference between different things (*Ray*). 2. Such discrimination of things as makes them easy to be observed.

To DISTI'NGUISH. *v. a.* (*distinguo*, Lat.) 1. To note the diversity of things (*Hooker*). 2. To separate from others by some mark of honour or preference (*Prior*). 3. To divide by notes or diversity (*Burnet*). 4. To know one from another by any mark or note of difference (*Watts*). 5. To discern critically; to judge (*Shakspeare*). 6. To constitute difference; to specificate (*Locke*). 7. To make known or eminent.

To DISTI'NGUISH. *v. n.* To make distinction; to find or shew the difference (*Child*).

DISTI'NGUISHABLE. *a.* (from *distinguish.*) 1. Capable of being distinguished (*Hale*). 2. Worthy of note; worthy of regard (*Swift*).

DISTI'NGUISHED. *particip. a.* Eminent; transcendent; extraordinary (*Rogers*).

DISTI'NGUISHER. *s.* (from *distinguish.*) 1. A judicious observer; one that accurately discerns one thing from another (*Dryden*). 2. He that separates one thing from another by proper marks of diversity (*Brown*).

DISTI'NGUISHINGLY. *ad.* With distinction; with some mark of preference (*Pope*).

DISTI'NGUISHMENT. *s.* Distinction; observation of difference (*Graunt*).

To DISTO'RT. *v. a.* (*distortus*, Latin.) 1. To writhe; to twist; to deform by irregular motions (*Smith*). 2. To put out of the true direction or posture (*Tillotson*). 3. To wrest from the true meaning (*Peacham*).

DISTO'RTION. *s.* (*distortio*, Latin.) Irregular motion by which the face is writhed or the parts disordered (*Prior*).

To DISTRA'CT. *v. a.* part. pass. *distracted*; anciently *distraught*. (*distractus*, Latin.) 1. To pull different ways at once (*Brown*). 2. To separate; to divide (*Shakspeare*). 3. To turn from a single direction towards various points (*South*). 4. To fill the mind with contrary considerations; to perplex; to confound (*Locke*). 5. To make mad (*Bacon*).

DISTRA'CTEDLY. *ad.* (from *distract.*) Madly; frantickly (*Shakspeare*).

DISTRA'CTEDNESS. *s.* (from *distract.*) The state of being distracted; madness.

DISTRA'CTION. *s.* (*distractio*, Latin.) 1. Tendency to different parts (*Shakspeare*). 2. Confusion; state in which the attention is called different ways (*Dryden*). 3. Perturbation of mind (*Tatler*). 4. Madness; frantickness; loss of the wits; vagrancy of the mind (*Atterbury*). 5. Disturbance; discord (*Clarendon*).

To DISTRA'IN. *v. a.* (from *distringo*, Lat.) To seize; to lay hold on (*Shakspeare*).

To DISTRA'IN. *v. n.* To make seizure (*Marvel*).

DISTRA'INER. *s.* He that seizes.

DISTRA'INT. *s.* (from *distrain.*) Seizure.

DISTRA'UGHT. *part. a.* (from *distract.*) Distracted (*Camden*).

DISTRE'SS. *s.* (*distresse*, French.) 1. The act of making a legal seizure (*Spenser*). 2. Compulsion, by which a man is assured to appear in court, or to pay a debt (*Cowell*). 3. The thing seized by law. 4. Calamity; misery; misfortune (*Shakspeare*).

DISTRESS, in law, the taking of a personal chattel, out of the possession of the wrong-doer, into the custody of the person who is injured, to procure a satisfaction for the wrong committed. It is of two kinds; cattle for trespassing, for doing damage; or for nonpayment of rent or other duties. But the most usual injury for which a distress may be taken is that of nonpayment of rent.

A distress may now be taken for any kind of rent in arrear, the detaining of which beyond the day of payment is an injury to him that is entitled to receive it. 4. G. II. c. 28. This is the most common and best remedy for the recovery of rent in arrear; and the effect of it is to compel the party to replevy the distress, and contest the taking in an action against the distrainer; or, which is more usual, to compound or pay the debt or duty for which he was distrained. 3. Black. 6.

Distress infinite, is a process commanding the sheriff to distrain a person from time to time, and continually afterwards, by taking his goods, by way of pledge, to inforce the performance of something due from the party distrained upon. Generally, it is provided that distress shall be reasonable and moderate; but in case of distress for suit of court, or for defect of appearance, in several cases where this is the only method of enforcing compliance, no distress can be immoderate; because, be it of what value it will, it cannot be sold, but shall be immediately restored on satisfaction made. 3. Black. 251.

Who may distrain for rent. By the common law and the various statues in favour of this species of remedy for recovery of rent, all persons having the reversion or remainder of lands, &c. after the determination of the particular estate, or existing term therein, may of common right distrain for rent in arrear, without any clause for that purpose contained in the lease. Co. Lit. 142.

What may or may not be distrained. Every thing upon the premises is liable to the landlord's distress for rent, whether they are the effects of a tenant or a stranger, because of the lien the landlord has on them in respect of the place where the goods are found, and not in respect to the person to whom they belong. Co. Lit. 47. 3. Bur. 1502. 3 Durnf. and East, 601.

Things not distrainable are, tools of a man's trade, corn sent to a mill, a horse sent to a smith's shop or in a common inn, cloth at a taylor's, goods in the hands of a carrier. 1 Salk. 249. 1 Esp. Rep. 206. 4 T. R. 569. Dogs, rabbits, beasts of the plough, milk, fruit, and things fixed to the freehold. 3 Black. 8 and 9. 4 T. R. 569. But beasts of the plough, and working-tools, not actually in use at the time, may be distrained, if there is not sufficient without them. 4 T R. 569. So may wearing apparel not actually in use. 1 Esp. Rep. 206. Money in a bag sealed may be distrained.

Horses and carriages sent to stand at livery are distrainable by the landlord. 3 Bur. 1498.

By 2 W. and M. it is provided, that where any goods or chattels shall be distrained for rent due on any demise, lease, or contract whatsoever, and the owner shall not, within five days next after such distress taken, and notice thereof, and of the cause of the taking left at the dwelling-house, or other most notorious place on the premises charged with the rent, replevy the same, that then, at the expiration of the said five days, the distrainer may, with the assistance of the sheriff, under-sheriff, or constable, cause the goods and chattels so distrained to be appraised by two sworn appraisers, and sold for the best price that can be got for the same, towards satisfaction of the rent for which the said goods and chattels have been distrained, and the costs and charges of such distress, appraisement, and sale; leaving the overplus (if any) in the hands of the said sheriff, or constable, for the use of the owner.

By stat. 2 W. c. 5, on any pound-breach or rescous of goods destrained for rent, the persons grieved thereby shall, in a special action on the case, recover treble damages and costs against the offender, or against the owner of the goods, if they are afterwards found to have come to his use or possession.

DISTRESS FOR PENALTIES. By 27 G. II. c. 20. s. 1, in all cases where any justice of the peace shall be required or empowered by any act of parliament to issue a warrant of distress for the levying any penalty inflicted, or any sum of money directed to be paid by such act, it shall be lawful for the justice granting such warrant, therein to order and direct the goods and chattels so to be distrained to be sold and disposed of within a certain time to be limited in such warrant; so as such time be not less than four days, nor more than eight days; unless the penalty, or sum of money for which the distress shall be made, together with the reasonable charges of taking and keeping such distress, shall be sooner paid.

To DISTRE'SS. *v. a.* (from the noun.) 1. To prosecute by law to a seizure. 2. To harass; to make miserable (*Deuteronomy*).

DISTRE'SSFUL. *a.* (*distress* and *full.*) Miserable; full of trouble; full of misery (*Pope*).

To DISTRI'BUTE. *v. a.* (*distribuo*, Lat.) To divide among more than two; to deal out; to dispensate (*Spenser*).

DISTRI'BUTER. *s.* One who deals out any thing; a dispenser (*Woodward*).

DISTRIBU'TION. *s.* (*distributio*, Latin.) 1. The act of distributing, or dealing out to others; dispensation (*Swift*). 2. Act of giving in charity (*Atterbury*).

DISTRIBUTION, in architecture, relates either to the plan, or the ornaments: 1 It denotes the dividing and dispensing the several parts and members, which enter into the plan of a building. 2. It denotes a judicious orderly placing of the ornaments in any order or edifice.

DISTRIBUTION, in rhetoric, a kind of description, whereby an orderly division and enumeration is made of the principal qualities of the subject. David supplies us with an example of this kind, when in the heat of his indignation against sinners, he gives a description of their iniquity: "Their throat is an open sepulchre; they flatter with their tongues; the poison of asps is under their lips; their mouth is full of cursing and lies; and their feet are swift to shed blood."

DISTRIBUTION, in printing, the taking a form asunder, separating the letters, and disposing them in the cases again, each in its proper cell. See PRINTING.

DISTRI'BUTIVE. *a.* (from *distribute.*) That is employed in assigning to others their portions; that allots to each his claim (*Dry.*).

DISTRI'BUTIVELY. *ad.* (from *distributive.*) 1. By distribution. 2. Singly; particularly (*Hooker*).

DI'STRICT. *s.* (*districtus*, Latin,) 1. The circuit within which a man may be compelled to appearance (*Cowell*). 2. Circuit of authority; province (*Addison*). 3. Region; country; territory (*Blackmore*).

DISTRI'CTION. *s.* (*districtus*, Latin.) Sudden display (*Collier*).

DISTRINGAS, a writ directed to the sheriff, or other officer, commanding him to distrain one for a debt to the king; or for his appearance at a certain day. See DISTRESS.

DISTRINGAS JURATORES, a writ directed to a sheriff, whereby he is commanded to distrain upon a jury to appear, and to return issues on their lands, &c. for non-appearance. This writ issues for the sheriff to have their bodies in court, &c. at the return of the writ.

To DISTRU'ST. *v. a.* (*dis* and *trust.*) To regard with diffidence; not to trust (*Wisdom*).

DISTRU'ST. *s.* (from the verb.) 1. Loss of credit; loss of confidence (*Milton*). 2. Suspicion; want of faith (*Dryden*).

DISTRU'STFUL. *a.* (*distrust* and *full.*) 1. Apt to distrust; suspicious (*Boyle*). 2. Not confident; diffident (*Gov. of Tongue*). 3. Diffident of himself; timorous (*Pope*).

DISTRU'STFULLY. *ad.* In a distrustful manner.

DISTRU'STFULNESS. *s.* The state of being distrustful; want of confidence.

To DISTU'RB. *v. a.* (*disturbo*, low Latin.) 1. To perplex; to disquiet (*Collier*). 2. To confound; to put into irregular motions. 3. To interrupt; to hinder. 4. To turn off from any direction (*Milton*).

DISTU'RB. *s.* (from the verb.) Confusion; tumultuary emotion (*Milton*).

DISTU'RBANCE. *s.* (from *disturb.*) 1. Perplexity; interruption of a settled state (*Locke*). 2. Confusion; disorder of thoughts (*Watts*). 3. Tumult; violation of peace (*Milton*).

DISTU'RBER. *s.* (from *disturb.*) 1. A violator of peace; he that causes tumults and public disorders (*Glanville*). 2. He that injures tranquillity (*Shakspeare*).

To DISTU'RN. *v. a.* (*dis* and *turn.*) To turn off; to turn aside: not in use (*Daniel*).

DISVALUA'TION. *s.* (*dis* and *valuation.*) Disgrace; diminution of reputation (*Bacon*).

To DISVA'LUE. *v. a.* To undervalue (*G. of Tongue*).

To DISVE'LOP. *v. a.* (*developer*, French.) To uncover.

DISU'NION. *s.* (*dis* and *union.*) 1. Separation; disjunction (*Granville*). 2. Breach of concord.

To DISUNI'TE. *v. a.* (*dis* and *unite.*) 1. To separate; to divide (*Pope*). 2. To part friends or allies.

To DISUNI'TE. *v. n.* To fall asunder; to become separate (*South*).

DISU'NITY. *s.* (*dis* and *unity.*) A state of actual separation (*More*).

DISU'SAGE. *s.* (*dis* and *usage.*) The gradual cessation of use or custom (*Hooker*).

DISU'SE. *s.* (*dis* and *use.*) 1. Cessation of use; desuetude (*Addison*). 2. Cessation of custom (*Arbuthnot*).

To DISU'SE. *v. a.* 1. To cease to make use of (*Dryden*). 2. To disaccustom (*Dryden*).

To DISVO'UCH. *v. a.* (*dis* and *vouch.*) To destroy the credit of; to contradict (*Shakspeare*).

DISWI'TTED. *a.* (*dis* and *wit.*) Deprived of the wits; mad: not in use (*Drayton*).

DIT. *s.* (*dicht*, Dutch.) A ditty; a poem; a tune: obsolete (*Spenser*).

DITA'TION. *s.* (*ditatus*, Latin.) The act of enriching (*Hall*).

DITCH. *s.* (dic, Saxon.) 1. A trench cut out in the ground, usually between fields (*Arbuthnot*). 2. Any long narrow receptacle of water (*Bacon*). 3. *Ditch* is used, in composition, of any thing worthless, or thrown into ditches (*Shakspeare*).

DITCH, in fortification, called also foss, and moat, is a trench dug round the rampart, or wall of a fortified place, between the scarp and counterscarp.

Ditches are either dry, or wet, that is, having water in them; both of which have their particular advantages. The earth dug out of the ditch serves to raise the rampart.

The ditch in front should be of such breadth as that tall trees may not reach over it, being from 12 to 24 fathoms wide, and 7 or 8 feet deep. The ditches on the sides are made smaller. But the most general rule is perhaps, that the dimensions of the ditch be such as that the earth dug out may be sufficient to build the rampart of a proper magnitude. The space sometimes left between the rampart and ditch, being about 6 or 8 feet, is called the berm, or list, serving to pass and repass, and to prevent the earth from rolling into the ditch.

To DITCH. *v. a.* To make a ditch (*Swift*).

DITCH-DELIVERED. *a.* Brought forth in a ditch (*Shakspeare*).

DI'TCHER. *s.* One who digs ditches (*Swift*).

DITHYRAMBIC, something that relates to the dithyrambus. We say a dithyrambic verse, dithyrambic poet, dithyrambic heat, &c. A compound dithyrambic word, Mr. Dacier observes, has sometimes its beauty and force. Some moderns call compositions which are in the taste of an ode, only not distinguished into strophes, and consisting of all kinds of verse indifferently, dithyrambic odes.

DITHYRAMBIC, is sometimes adjectively, to signify wild, or enthusiastic.

DITHYRAMBUS, Διθυραμβος, in the ancient poetry, a hymn in honour of Bacchus, full of transport, and poetical rage.

The measure, which is what distinguishes this kind of poetry, is said to have been invented by Dithyrambus, a Theban; but Pindar attributes it to the Corinthians; and the modern etymologists furnish us with another origin of the word. In effect, the verse might be called thus from the god it was consecrated to, who himself was named Dithyrambus, either on account of his having been brought twice into the world, according to the fable of Semele and Jupiter, or by reason of his having triumphed twice, from δις, twice, and θριαμβος, triumph. Be this as it will, the ancients, we are told by Aristotle and Horace, gave the appellation dithyrambus to those verses wherein none of the common rules or measures were observed; much like those called by the French *vers libres*, by the Italians *versi sciolti*, and by the modern Greeks *politici*, a name they give to prose, which these verses resemble more than poetry.

DITONE, DITONUM, in music, an interval comprehending two tones, a greater and a less. (See INTERVAL and TONE.) The word is formed of δις, twice, and τονος, tone. The ratio of the sounds that form the ditone is of 4 to 5; and that of the semi-ditone, of 5 to 6.

DITRIGLYPH, in architecture, the space between two triglyphs.

DITTANDER, in botany. See NASTURTIUM and DICTAMNUS.

DITTANY, in botany. See ORIGANUM.

DI'TTIED. *a.* (from *ditty.*) Sung; adapted to music (*Milton*).

DITTO, in books of accounts, often written d°. signifies the same, viz. as the preceding article.

DITTON (Humphry), an eminent mathematician, was born at Salisbury, May 29, 1675. Being an only son, and his father observing in him an extraordinary good capacity, determined to cultivate it with a good education. For this purpose he placed him in a reputable private academy; upon quitting of which he, at the desire of his father, though against his own inclination, engaged in the profession of divinity, and began to exercise his function at Tunbridge, in the county of Kent, where he continued to preach some years; during which time he married a lady of that place. But a weak constitution, and the death of his father, induced Mr. Ditton to quit that profession. And at the persuasion of Dr. Harris and Mr. Whiston, both eminent mathematicians, he engaged in the study of mathematics; a science to which he had always a strong inclination. In the prosecution of this science, he was much encouraged by the success and applause he received: being greatly esteemed by the chief professors of it, and particularly by sir Isaac Newton, by whose interest and recommendation he was elected master of the new mathematical school in Christ's hospital; where he continued till his death, which happened in 1715. Mr. Ditton published several tracts on different subjects: but is most noted for his Treatises on the New Law of Fluids, and on Perspective, his Institution of Fluxions, and his Discourse on the Resurrection of Jesus Christ.

DI'TTY. *s.* (*dicht*, Dutch.) A poem to be sung; a song, generally of a pensive cast.

DIU, an island at the entrance of the gulf of

Cambay, in the Deccan of Hindustan, three miles long and one broad. On it is a large fortified town of the same name, built of freestone and marble, and containing some fine churches, erected by the Portuguese. Lat. 20. 43 N. Lon. 69. 52 E.

DIVALIA, a feast held among the ancient Romans, on the twenty-first of December, in honour of the goddess Voluptia, or Angerona. It is sometimes called Angeronalia.

DIVAN, a council-chamber, or court, wherein justice is administered, in the eastern nations, particularly among the Turks. Divan is an Arabic word, signifying the same with sopha in the Turkish dialect. There are two sorts of divans, that of the grand signior, called the council of state, which consists of seven of the principal officers of the empire; and that of the grand vizir, composed of six other vizirs, or counsellors of state, the chancellor, and secretaries of state, for the distribution of justice.

DIVAN-BEGHI, the superintendant of justice in Persia, whose place is the last of the six ministers of the second rank, who are all under the athemadauler or first minister.

To DIVA'RICATE. *v. n.* (*divaricatus*, Lat.) To be parted into two; to become bifid (*Woodward*).

To DIVA'RICATE. *v. a.* To divide into two (*Grew*).

DIVARICA'TION *s.* (*divaricatio*, Latin.) 1. Partition into two (*Ray*). 2. Division of opinions (*Brown*).

To DIVE. *v. a.* (ꝺippan, Saxon.) 1. To sink voluntarily under water (*Dryden*). 2. To go under water in search of any thing (*Raleigh*). 3. To go deep into any question, doctrine, or science (*Blackmore*). 4. To immerge into any business or condition (*Shakspeare*). 5. To depart from observation; to sink (*Shakspeare*).

To DIVE. *v. a.* To explore by diving (*Denham*).

To DIVE'LL. *v. n.* (*divello*, Lat.) To pull; to separate; to sever (*Brown*).

DI'VER. *s.* (from *dive*.) 1. One that sinks voluntarily under water (*Pope*). 2. One that goes under water in search of treasure (*Woodward*). 3. He that enters deep into knowledge or study (*Wotton*).

DIVER, in ornithology. See COLYMBUS.

To DIVE'RGE. *v. n.* (*divergo*, Latin.) To tend various ways from one point (*Newton*).

DIVE'RGENT. *a.* (from *divergens*, Latin.) Tending to various parts from one point.

DIVERGING SERIES, in mathematics, series, the terms of which grow larger and larger, the farther they are continued.

DI'VERS. *a.* (*diversus*, Lat.) Several; sundry; more than one: out of use (*Whitgift*).

DIVE'RSE. *a.* (*diversus*, Latin.) 1. Different from another (*Daniel*). 2. Different from itself; multiform (*Ben Jonson*). 3. In different directions (*Pope*).

DIVERSIFICA'TION. *s.* (from *diversify*.) 1. The act of changing forms or qualities (*Boyle*). 2. Variation; variegation. 3. Variety of forms; multiformity. 4. Change; alteration (*Hale*).

To DIVE'RSIFY. *v. a.* (*diversifier*, Fr.) 1. To make different from another; to distinguish; to discriminate (*Addison*). 2. To make different from itself; to vary; to variegate (*Sidney*).

DIVERSIFYING, in rhetoric, is of infinite service to the orator; it is an accomplishment essential to his character, and may fitly be called the subject of all his tropes and figures. Vossius lays down six ways of diversifying a subject. 1. By enlarging on what was briefly mentioned before. 2. By a concise enumeration of what had been insisted on at length. 3. By adding something new to what is repeated. 4. By repeating only the principal heads of what had been said. 5. By transposing the words and periods. 6. By imitating them. Voss. Rhet. lib. v. p. 281, seq.

DIVE'RSION. *s.* (from *divert*.) 1. The act of turning any thing off from its course (*Bacon*). 2. The cause by which any thing is turned from its proper course or tendency (*Denham*). 3. Sport; something that unbends the mind by turning it off from care (*Waller*). 4. (In war.) The act or purpose of drawing the enemy off from some design, by threatening or attacking a distant part.

DIVE'RSITY. *s.* (*diversité*, Fr. *diversitas*, Lat.) 1. Difference; dissimilitude; unlikeness (*Arbuthnot*). 2. Variety (*Rogers*). 3. Distinct being; not identity (*Locke*). 4. Variegation (*Pope*).

DI'VERSLY. *ad.* (from *diverse*.) 1. In different ways; differently; variously (*Wotton*). 2. In different directions (*Pope*).

To DIVE'RT. *v. a.* (*diverto*, Lat.) 1. To turn off from any direction or course (*Locke*). 2. To draw forces to a different part (*Davies*). 3. To withdraw the mind (*Philips*). 4. To please; to exhilarate (*Swift*).

DIVE'RTER. *s.* (from the verb.) Any thing that diverts or alleviates (*Walton*).

DIVERTI'CULUM. (*diverticulum*.) A mal-formation or diseased appearance of intestine, in which a portion of intestine goes out of the regular course of the tube; and thereby forms a deviation from the usual course of the alimentary canal.

DIVERTI'CULUM NUCKII. The opening through which the round ligaments of the uterus pass. Nuck asserted that it remained open a long time after birth; to these openings he gave the name of diverticula.

To DIVERTI'SE. *v. a.* (*divertiser*, Fr.) To please; to exhilarate; to divert (*Dryden*).

DIVE'RTISEMENT. *s.* (*divertissement*, Fr.) Diversion; delight; pleasure (*Government of the Tongue*).

DIVE'RTIVE. *a.* (from *divert*.) Recreative; amusive; exhilarating (*Rogers*).

To DIVE'ST. *v. a.* (*devestir*, Fr.) To strip; to make naked; to denude (*Denham*).

DIVE'STURE. *s.* (from *divest*.) The act of putting off (*Boyle*).

DIVI'DABLE. *a.* (from *divide*.) Separate; different; parted: not used (*Shakspeare*).

DIVI'DANT. *a.* (from *divide.*) Different; separate: not in use (*Shakspeare*).

To **DIVI'DE.** *v. a.* (*divido*, Latin.) 1. To part one whole into different pieces (*Dryden. Locke*). 2. To separate; to keep apart, by standing as a partition between (*Dryden*). 3. To disunite by discord (*Luke*). 4. To deal out; to give in shares (*Locke*).

To **Divi'de.** *v. n.* 1. To part; to sunder. 2. To break friendship (*Shakspeare*).

DIVIDEND OF STOCKS, is a share or proportion of the interest of stocks erected on public funds, as the south-sea, &c. divided among and paid to the stock-holders half-yearly.

The amount of unclaimed dividends remaining in the hands of the Bank of England, previous to the year 1750, seldom exceeded 50,000*l.*; its increase since that period will appear from the following extract from an account laid before the House of Commons.

	£.	*s.*	*d.*
On July, 5, 1759	102,075	4	11¾
.... 1769	227,928	6	2¼
.... 1779	314,885	8	3¼
.... 1789	547,366	16	6¾

In 1791, an act was passed, authorising the Bank to advance out of the unclaimed dividends in their hands 500,000*l.* for the public service; with a provision that if the sum in their hands should be reduced under 600,000*l.* the difference should be repaid them. In consequence of the publication of the names of the proprietors of the dividends then unclaimed, a considerable part of them were received, and the sum advanced to government thus became only 376,739*l.* The amount of unclaimed dividends has accumulated considerably, being

On April 1, 1806	£1,235,265
—- July 1	1,003,599
—- October 1	1,007,778
—- January 1, 1807	1,019,336

In consequence of this great increase, the Bank, in 1808, advanced the further sum of 500,000*l.* for the public service, on condition that the balance in their hands, on this account, should never be reduced below 100,000*l.*

Dividend, in the university, signifies that part or share which every one of the fellows equally divide among themselves of their yearly stipend.

Dividend, in arithmetic and algebra, the number given to be divided.

DIVI'DER *s.* (from *divide.*) 1. That which parts any thing into pieces (*Digby*). 2. A distributer; he who deals out to each his share (*Luke*). 3. A disuniter (*Swift*). 4. A particular kind of compasses.

DIVIDING INSTRUMENTS, are contrivances invented for the purpose of making with accuracy the graduations upon astronomical and mathematical instruments. A very interesting history of the various methods devised for this purpose, from the time of Dr. Hooke, down to the year 1786, is given by Mr. Smeaton, in the Phil. Transac. vol. lxxvi.; or in the New Abridgement, vol. xvi. p. 30—36.

DIVI'DUAL. *a.* (*dividuus*, Lat.) Divided; shared or participated in common with others (*Milton*).

DIVINATION, implies the knowledge of things obscure or future, which cannot be attained by any natural means. It was a received opinion among the heathens, that the gods were wont to converse familiarly with some men, whom they endowed with extraordinary powers, and admitted to the knowledge of their councils and designs. Plato, Aristotle, Plutarch, Cicero, and others, divide divination into two species, viz. natural and artificial. The former was so called, because not attained by any rules of art, but infused or inspired into the diviner, without his taking any farther care about it than to purify and prepare himself for the reception of the divine afflatus. Of this kind were all those who delivered oracles, and foretold future events by inspiration, without observing external signs or accidents. The second species of divination was called artificial, because it was not obtained by immediate inspiration, but proceeded upon certain experiments and observations arbitrarily instituted, and mostly superstitious. Of this sort there were various kinds, as by sacrifices, entrails, flame, cakes, flour, wine, water, birds, lots, verses, omens, &c.

In Holy Scripture we find mention made of nine different kinds of divination. The first performed by the inspection of planets, stars, and clouds: it is supposed to be the practisers of this whom Moses calls מעונן, *meonen*, of ענן, *anan*, cloud, Deuter. ch. xviii. v. 10. 2. Those whom the prophet calls in the same place מנחש, *menachesch*, which the Vulgate and generality of interpreters render augur. 3. Those who in the same place are called מכשף, *mecascheph*, which the Septuagint and Vulgate translate, "a man given to ill practices." 4. Such authors whom Moses in the same chapter, ver. 11, calls חובר *hhober*. 5. Those who consult the spirits called Python; or, as Moses expresses it, in the same book, אוב אשל, "those who ask questions of Python." 6. Witches or magicians, whom Moses calls ידעני, *judeoni*. 7. Those who consult the dead; necromancers. 8. The prophet Hosea, chap. iv. ver. 12, mentions such as consult staves, מקלו שאל; which kind of divination may be called rhabdomancy. 9. The last kind of divination mentioned in Scripture is hepatoscopy, or the consideration of the liver.

Divination of all kinds was necessarily made an occult science, which naturally remained in the hands of the priests and priestesses, the magi, the soothsayers, &c. Much to the honour of the eighteenth century, the pure doctrines of Christianity, and the spirit of philosophy, which become every day more diffused, equally concur in banishing these visionary opinions; though there are still a few impostors of the lowest order that practise their frauds on the ignorant and unthinking.

DIVI'NE. *a.* (*divinus*, Lat.) 1. Partaking of the nature of God (*Dryden*). 2. Proceeding from God; not natural; not human

(*Hooker*). 3. Excellent in a supreme degree (*Davies*). 4. Presageful; divining; prescient (*Milton*).

DIVI'NE. *s.* 1. A minister of the gospel; a priest; a clergyman (*Bacon*). 2. A man skilled in divinity; a theologian (*Denham*).

To **DIVI'NE.** *v. a.* (*divino*, Lat.) To foretel; to foreknow; to presage (*Shakspeare*).

To **DIVI'NE.** *v. n.* 1. To utter prognostication (*Shakspeare*). 2. To feel presages (*Shakspeare*). 3. To conjecture; to guess (*Granville*).

DIVI'NELY. *ad.* (from *divine.*) 1. By the agency or influence of God (*Bentley*). 2. Excellently; in the supreme degree (*Milton*). 3. In a manner noting a deity (*Addison*).

DIVI'NENESS. *s.* (from *divine.*) 1. Divinity; participation of the divine nature (*Grew*). 2. Excellence in the supreme degree (*Shakspeare*).

DIVI'NER. *s.* (from *to divine.*) 1. One that professes divination, or the art of revealing occult things by supernatural means (*Brown*). 2. Conjecturer; guesser (*Locke*).

DIVI'NERESS. *s.* (from *diviner.*) A prophetess; a woman professing divination (*Dryden*).

DIVING, the art or act of descending under water to considerable depths, and abiding there a competent time. The uses of diving are very considerable, particularly in the fishing for pearls, corals, spunges, &c. See PEARL-FISHING, &c.

There have been various methods proposed, and machines contrived, to render the practice of diving more safe and easy. The great point is to furnish the diver with fresh air; without which he must either make a short stay or perish. Hence, where there has been occasion to continue long at the bottom, some have contrived double flexible pipes, to circulate air down into a cavity, inclosing the diver as with armour, both to furnish air and to bear off the pressure of the water, and allow his breast to dilate upon inspiration; the fresh air being forced down one of the pipes with bellows, and returning by the other pipe.

But this method is impracticable when the depth surpasses three fathoms; the water embracing the bare limbs so closely as to obstruct the circulation of the blood in them; and also pressing so strongly on all the junctures where the armour is made tight with leather, that, if there be the least defect in any of them, the water rushes in, and instantly fills the whole engine, to the great danger of the diver's life.

It is said to be a fact, that people, by being accustomed to the water from their infancy, will at length be enabled, not only to stay much longer under water than could be supposed, but put on a kind of amphibious nature, so that they seem to have the use of all their faculties as well when their bodies are immersed in water as when they are on dry land. Most savage nations are remarkable for this. According to the accounts of our late voyagers, the inhabitants of the South sea islands are such expert divers, that when a nail or any piece of iron was thrown overboard, they would instantly jump into the sea after it, and never failed to recover it, notwithstanding the quick descent of the metal. Even among civilized nations, many persons have been found capable of continuing an incredible length of time under water. The most remarkable instance of this kind is the famous Sicilian diver Nicolo Pesce, who, according to the marvellous account given by Kircher, had from his infancy been so used to the sea, that at last it became his almost natural element. It is said, he was frequently known to spend five days in the midst of the waves, without any other provisions than the fish which he caught there and ate raw. He often swam over from Sicily into Calabria, a tempestuous and dangerous passage, carrying letters from the king; and as frequently swam among the gulphs of the Lipari islands, no way apprehensive of danger. "In order (says Kircher) to aid these powers of enduring in the deep, nature seemed to have assisted him in a very extraordinary manner: for the spaces between his fingers and toes were webbed, as in a goose; and his chest became so very capacious, that he could take in, at one inspiration, as much breath as would serve him for a whole day." At length, however, we are told, this extraordinary person met his fate in exploring the depths of Charybdis, at the instance of the king; who, after he had once succeeded in fetching up a golden cup that had been thrown in, ordered him to repeat the experiment.

The following description of a diving-machine, invented by Mr. Bushnell, of Connecticut, is given in the Transactions of the American Philosophical Society.

The external shape of the sub-marine vessel bore some resemblance to two upper tortoise-shells of equal size, joined together; the place of entrance into the vessel being represented by the opening made by the swell of the shells, at the head of the animal. The inside was capable of containing the operator, and air sufficient to support him thirty minutes without receiving fresh air. At the bottom, opposite to the entrance, was fixed a quantity of lead for ballast. At one edge, which was directly before the operator, who sat upright, was an oar for rowing forward or backward. At the other edge was a rudder for steering. An aperture, at the bottom, with its valve, was designed to admit water, for the purpose of descending; and two brass forcing-pumps served to eject the water within, when necessary for ascending. At the top there was likewise an oar for ascending or descending, or continuing at any particular depth. A water-gauge, or barometer, determined the depth of descent, a compass directed the course, and a ventilator within supplied the vessel with fresh air, when on the surface.

The entrance into the vessel was elliptical, and so small as barely to admit a person. This entrance was surrounded with a broad elliptical iron band, the lower edge of which was let into the wood of which the body of the vessel was made, in such a manner as to give its utmost support to the body of the vessel against the pressure of the water. Above the upper edge of this iron band there was a brass crown, or cover, resembling a hat with its crown and brim, which shut water-tight upon the iron band: the crown was hung to the iron band with hinges, so as to turn over sideways when opened. To make it perfectly secure when shut, it might be screwed down upon the band by the operator, or by a person without.

There were in the brass crown three round doors, one directly in front, and one on each side, large enough to put the hand through. When open they admitted fresh air; their shutters were ground perfectly tight into their places with emery, hung with hinges, and secured in their places when shut. There were likewise several small glass windows in the crown for looking through, and for admitting light in the day-time, with covers to secure them. There were two air-pipes in the crown. A ventilator within drew fresh air through one of the air-pipes, and discharged it into the lower part of the vessel; the fresh air introduced by the ventilator expelled the impure light air through the other air-pipe. Both air-pipes were so constructed, that they shut themselves whenever the water rose near their tops, so that no water could enter through them, and opened themselves immediately after they rose above the water.

The vessel was chiefly filled with lead fixed to its bottom; when this was sufficient, a quantity was placed within, more or less, according to the weight of the operator; its ballast made it so stiff, that there was no danger of oversetting. The vessel with all its appendages, and the operator, was sufficient to settle it very low in the water. About two hundred pounds of the lead, at the bottom for ballast, would be let down forty or fifty feet below the vessel; this enabled the operator to rise instantly to the surface of the water, in case of accident.

When the operator would descend, he placed his foot on the top of a brass valve, depressing it, by which he opened a large aperture in the bottom of the vessel, through which the water entered at his pleasure; when he had admitted a sufficient quantity, he descended very gradually; if he admitted too much, he ejected as much as was necessary to obtain an equilibrium, by the two brass forcing pumps, which were placed at each hand. Whenever the vessel leaked, or he would ascend to the surface, he also made use of these forcing pumps. When the skilful operator had obtained an equilibrium, he could row upward, or downward, or continue at any particular depth, with an oar, placed near the top of the vessel, formed upon the principle of the screw, the axis of the oar entering the vessel; by turning the oar one way he raised the vessel, by turning it the other way he depressed it.

A glass tube eighteen inches long, and one inch in diameter, standing upright, its upper end closed, and its lower end, which was open, screwed into a brass pipe, through which the external water had a passage into the glass tube, served as a water-gauge or barometer. There was a piece of cork, with phosphorus on it, put into the water-gauge. When the vessel descended the water rose in the water-gauge, condensing the air within, and bearing the cork, with its phosphorus, on its surface. By the light of the phosphorus, the ascent of the water in the gauge was rendered visible, and the depth of the vessel under water ascertained by a graduated line.

An oar, formed upon the principle of the screw, was fixed in the fore part of the vessel; its axis entered the vessel, and being turned one way, rowed the vessel forward, but being turned the other way rowed it backward; it was made to be turned by the hand or foot.

A rudder, hung to the hinder part of the vessel, commanded it with the greatest ease. The rudder was made very elastic, and might be used for rowing forward. Its tiller was within the vessel, at the operator's right hand, fixed, at a right angle, on an iron rod, which passed through the side of the vessel; the rod had a crank on its outside end, which commanded the rudder, by means of a rod extending from the end of the crank to a kind of tiller, fixed upon the left hand of the rudder. Raising and depressing the first-mentioned tiller, turned the rudder as the case required.

A compass marked with phosphorus directed the course, both above and under the water; and a line and lead sounded the depth when necessary.

The internal shape of the vessel, in every possible section of it, verged towards an ellipsis, as near as the design would allow, but every horizontal section, although elliptical, yet as near to a circle as could be admitted. The body of the vessel was made exceedingly strong; and to strengthen it as much as possible, a firm piece of wood was framed, parallel to the conjugate diameter, to prevent the sides from yielding to the great pressure of the incumbent water, in a deep immersion. This piece of wood was also a seat for the operator.

Every opening was well secured. The pumps had two sets of valves. The aperture at the bottom, for admitting water, was covered with a plate, perforated full of holes to receive the water, and prevent any thing from choaking the passage, or stopping the valve from shutting. The brass valve might likewise be forced into its place with a screw, if necessary. The air-pipes had a kind of hollow sphere, fixed round the top of each, to secure the air-pipe valves from injury: these hollow spheres were perforated full of holes, for the passage of the air through the pipes: within the air-pipes were shutters to secure them, should any accident happen to the pipes, or the valves on their tops.

Wherever the external apparatus passed through the body of the vessel, the joints were round, and formed by brass pipes, which were driven into the wood of the vessel, the holes through the pipes were very exactly made, and the iron rods, which passed through them, were turned in a lathe to fit them; the joints were also kept full of oil, to prevent rust and leaking. Particular attention was given to bring every part, necessary for performing the operations, both within and without the vessel, before the operator, and as conveniently as could be devised; so that every thing might be found in the dark, except the water-gauge and the compass, which were visible by the light of the phosphorus, and nothing required the operator to turn to the right hand, or to the left, to perform any thing necessary.

The inventor next pursues the subject under the following heads:

1. Description of a magazine, and its appendages, designed to be conveyed by the sub-marine vessel to the bottom of a ship.—In the fore part of the brim of the crown of the sub-marine vessel, was a socket, and an iron tube, passing through the socket; the tube stood upright, and could slide up and down in the socket, six inches: at the top of the tube was a wood-screw, fixed by means of a rod, which passed through the tube, and screwed the wood-screw fast upon the top of the tube: by pushing the wood-screw up against the bottom of a ship, and turning it at the same time, it would enter the planks; driving would also answer the same purpose; when the wood-screw was firmly fixed, it could be cast off by unscrewing the rod, which fastened it upon the top of the tube.

Behind the sub-marine vessel was a place, above the rudder, for carrying a large powder magazine;

this was made of two pieces of oak timber, large enough, when hollowed out, to contain 150 pounds of powder, with the apparatus used in firing it, and was secured in its place by a screw, turned by the operator. A strong piece of rope extended from the magazine to the wood-screw above-mentioned, and was fastened to both. When the wood-screw was fixed, and to be cast off from its tube, the magazine was to be cast off likewise by unscrewing it, leaving it hanging to the wood-screw; it was lighter than the water, that it might rise up against the object, to which the wood-screw and itself were fastened.

Within the magazine was an apparatus, constructed to run any proposed length of time, under twelve hours; when it had run out its time, it unpinioned a strong lock resembling a gun lock, which gave fire to the powder. This apparatus was so pinioned, that it could not possibly move, till, by casting off the magazine from the vessel, it was set in motion.

The skilful operator could swim so low on the surface of the water, as to approach very near a ship, in the night, without fear of being discovered, and might, if he chose, approach the stem or stern above water, with very little danger. He could sink very quickly, keep at any depth he pleased, and row a great distance in any direction he desired, without coming to the surface, and when he rose to the surface, he could soon obtain a fresh supply of air, when, if necessary, he might descend again, and pursue his course.

2. Experiments made to prove the nature and use of a submarine vessel.—The first experiment made was with about two ounces of gunpowder, which were exploded four feet under water, to prove to some of the first personages in Connecticut that powder would take fire under water.

The second experiment was made with two pounds of powder, inclosed in a wooden bottle, and fixed under a hogshead, with a two-inch oak plank between the hogshead and the powder; the hogshead was loaded with stones as deep as it could swim; a wooden pipe descending through the lower head of the hogshead, and through the plank, into the powder contained in the bottle, was primed with powder. A match put to the priming, exploded the powder, which produced a very great effect, rending the plank into pieces; demolishing the hogshead; and casting the stones and the ruins of the hogshead, with a body of water, many feet into the air, to the astonishment of the spectators. This experiment was likewise made for the satisfaction of the gentlemen above-mentioned.

There were afterwards made many experiments of a similar nature, some of them with large quantities of powder; they all produced very violent explosions, much more than sufficient for any purpose had in view.

In the first essays with the sub-marine vessel, the inventor took care to prove its strength to sustain the great pressure of the incumbent water, when sunk deep, before he trusted any person to descend much below the surface: and he never suffered any person to go under water without having a strong piece of rigging made fast to it, until he found him well acquainted with the operations necessary for his safety. After that he made him descend, and continue at particular depths, without rising or sinking, row by the compass, approach a vessel, go under her, and fix the wood-screw mentioned before into her bottom, &c. until he thought him sufficiently expert to put any design into execution.

It required many trials to make a person of common ingenuity a skilful operator: the first employed was very ingenious, and made himself master of the business, but was taken sick in the campaign of 1776, at New York, before he had an opportunity to make use of his skill, and never recovered his health sufficiently afterwards.

3. Experiments made with a sub-marine vessel. After various attempts to find an operator to his wish, Mr. Bushnell sent one, who appeared more expert than the rest, from New York, to a fifty-gun ship, lying not far from Governor's island. He went under the ship, and attempted to fix the wooden screw into her bottom, but struck, as he supposes, a bar of iron, which passes from the rudder hinge, and is spiked under the ship's quarter. Had he moved a few inches, which he might have done, without rowing, he would probably have found wood where he might have fixed the screw; or, if the ship were sheathed with copper, he might easily have pierced it: but not being well skilled in the management of the vessel, in attempting to move to another place, he lost the ship; after seeking her in vain, for some time, he rowed some distance, and rose to the surface of the water, but found day-light had advanced so far, that he durst not renew the attempt. The adventurer said he could easily have fastened the magazine under the stem of the ship, above water, as he rowed up to the stern, and touched it before he descended. Had he fastened it there, the explosion of 150 pounds of powder (the quantity contained in the magazine) must have been fatal to the ship. In his return from the ship to New York, he passed near Governor's island, and thought he was discovered by the enemy on the island; being in haste to avoid the danger he feared, he cast off the magazine, as he imagined it retarded him in the swell, which was very considerable. After the magazine had been cast off one hour, the time the internal apparatus was set to run, it blew up with great violence.

Afterwards, there were two attempts made in Hudson's river, above the city, but they effected nothing. One of them was by the afore-mentioned person. In going towards the ship, he lost sight of her, and went a great distance beyond her: when he at length found her, the tide ran so strong, that, as he descended under water, for the ship's bottom, it swept him away. Soon after this, the enemy went up the river, and pursued the boat which had the sub-marine vessel on board, and sunk it with their shot. "Though, (says Mr. Bushnell), I afterwards recovered the vessel, I found it impossible, at that time, to prosecute the design any further. I had been in a bad state of health, from the beginning of my undertaking, and was now very unwell; the situation of public affairs was such, that I despaired of obtaining the public attention, and the assistance necessary. I was unable to support myself, and, the persons I must have employed, had I proceeded. Besides, I found it absolutely necessary, that the operators should acquire more skill in the management of the vessel, before I could expect success: which would have taken up some time, and made no small additional expence. I therefore gave over the pursuit for that time, and waited for a more favourable opportunity, which never arrived."

4. Other experiments made with a design to fire shipping.—In the year 1777, Mr. Bushnell made

an attempt from a whale-boat against the Cerberus frigate, then lying at anchor between Connecticut river and New London, by drawing a machine against her side, by means of a line. The machine was loaded with powder, to be exploded by a gun-lock, which was to be unpinioned by an apparatus, to be turned by being brought alongside of the frigate. This machine fell in with a schooner at anchor, astern of the frigate, and concealed from his sight. By some means or other it was fired, and demolished the schooner and three men; and blew the only one left alive overboard, who was taken up very much hurt.

After this he fixed several kegs under water, charged with powder, to explode, upon touching any thing, as they floated along with the tide: he set them afloat in the Delaware, above the English shipping at Philadelphia, in December, 1777. "I was unacquainted, (says he), with the river, and obliged to depend upon a getleman very imperfectly acquainted with that part of it, as I afterwards found. We went as near the shipping as he durst venture; I believe the darkness of the night greatly deceived him, as it did me. We set them adrift, to fall with the ebb, upon the shipping. Had we been within sixty rods I believe they must have fallen in with them immediately, as I designed; but, as I afterwards found, they were set adrift much too far distant, and did not arrive until after being detained some time by frost, they advanced in the day-time, in a dispersed situation, and under great disadvantages. One of them blew up a boat with several persons in it, who imprudently handled it too freely, and thus gave the British that alarm which brought on the battle of the kegs."

Diving-bell, is a machine so contrived that the diver is safely conveyed to any reasonable depth, and may stay more or less time under the water, as the bell is greater or less. It is most conveniently made in form of a truncated cone, the smallest base being closed, and the larger open. It is to be poised with lead, and so suspended, that it may sink full of air, with its open basis downward, and as near as may be in a situation parallel to the horizon, so as to close with the surface of the water all at once.

Under this covercle the diver sitting, sinks down with the included air to the depth desired; and if the cavity of the vessel can contain a ton of water, a single man may remain a full hour, without much inconvenience, at five or six fathoms deep. But the lower he goes, still the more the inclined air contracts itself, according to the weight of the water that compressed it; so that at thirty-three feet deep, the bell becomes half full of water; the pressure of the incumbent water being then equal to that of the atmosphere; and at all other depths, the space occupied by the compressed air in the upper part of its capacity, is to the space filled with water, as thirty-three feet to the depth of the surface of the water in the bell below the common surface of it. And this condensed air, being taken in with the breath, soon insinuates itself into all the cavities of the body, and has no ill effect, provided the bell be permitted to descend so slowly as to allow time for that purpose.

One inconvenience that attends it, is found in the ears, within which there are cavities which open only outwards, and that by pores so small, as not to give admission even to the air itself, unless they be dilated and distended by a considerable force. Hence, on the first descent of the bell, a pressure begins to be felt on each ear, which, by degrees, grows painful, till the force overcoming the obstacle, what constringes these pores, yields to the pressure, and letting some condensed air slip in, presently ease ensues. The bell descending lower, the pain is renewed, and afterwards it is again eased in the same manner. But the greatest inconvenience of this engine is, that the water entering it, contracts the bulk of air into so small a compass, that it soon heats, and becomes unfit for respiration: so that there is a necessity for its being drawn up to recruit it; besides the uncomfortable abiding of the diver, who is almost covered with water.

To obviate the difficulties of the diving-bell, Dr. Halley, to whom we owe the preceding account, contrived some further apparatus, by which not only to recruit and refresh the air from time to time, but also to keep the water wholly out of it at any depth.

But before we proceed to the minuter description of diving-bells, we shall speak a little of the history of such contrivances. In the works of Aristotle, we read of a kind of kettle used by divers to enable them to remain for some time under water; but the manner in which those kettles were employed is not clearly described. "The oldest information (says professor Beckmann) which we have of the use of the diving-bell in Europe, is that of John Taisnier, who was born at Hainault in 1509, had a place at court under Charles V. whom he attended on his voyage to Africa. He relates in what manner he saw at Toledo, in the presence of the emperor and several thousand spectators, two Greeks let themselves down under water, in a large inverted kettle, with a burning light, and rise up again without being wet. It appears that this art was then new to the emperor and the Spaniards, and that the Greeks were caused to make the experiment in order to prove the possibility of it."

When the English, in 1588, dispersed the Spanish fleet, called the Invincible Armada, part of the ships went to the bottom, near the isle of Mull, on the western coast of Scotland; and some of these, according to the account of the Spanish prisoners, contained great riches. This information excited, from time to time, the avarice of speculators, and gave rise to several attempts to procure part of the lost treasure. In the year 1665, a person was so fortunate as to bring up some cannon, which, however, were not sufficient to defray the expences. Of these attempts, and the kind of diving-bell used in them, the reader will find an account in a work printed at Rotterdam in 1669, and entitled *G. Sinclari Ars nova et magna gravitatis et levitatis*. In the year 1680, William Phipps, a native of America, formed a project for searching and unloading a rich Spanish ship sunk on the coast of Hispaniola; and represented his plan in such a plausible manner, that king Charles II. gave him a ship, and furnished him with every thing necessary for the undertaking. He set sail in the year 1683; but being unsuccessful, returned again in great poverty, though with a firm conviction of the possibility of his scheme. By a subscription promoted chiefly by the duke of Albemarle, the son of the celebrated monk, Phipps was enabled, in 1687, to try his fortune once more, having previously engaged to divide the profit according to the twenty shares of which the subscription consisted. At first all his labour proved fruitless; but at last, when his patience was almost entirely exhausted, he was so lucky as to bring up, from the depth of six or seven fathoms, so much treasure that he returned to England with the value of two hundred thousand pounds sterling. Of this sum he himself got about sixteen, others say twenty thousand, and the duke ninety thousand pounds. After he came back, some persons endeavoured to persuade the king to seize both the ship and the cargo, under a pretence that Phipps, when he solicited for his majesty's permission, had not given accurate information respecting the business. But the king answered, with much greatness of mind, that he knew Phipps to be an honest man, and that he and his friends should share the whole among them had he returned with double the value. His majesty even conferred upon him the honour of knighthood, to shew how much he was satisfied with his conduct. We know not the construction of Phipps's apparatus; but of the old figures of a diving machine, that which approaches nearest to the diving-bell is in a book on fortification by Lorini; who describes a square box bound round with iron, which is furnished with windows, and has a stool affixed to it for the diver. This ingenious contrivance appears, however, to be older than that Italian; at least he does not pretend to be the inventor of it.

In the year 1617, Francis Kessler gave a description of his water-armour, intended also for diving, but which cannot really be used for that purpose. In the year 1671, Witsen taught, in a better manner than any of his predecessors, the construction and use of the diving-bell; but he is much mistaken when he says that it was invented at Amsterdam. In 1679 appeared, for the first time, Borelli's well-known work *de motu animalium*, in which he not only described the diving-bell, but also proposed another, the impracticability of which was shewn by James Bernoulli. When Sturm published his *Collegium curiosum* in 1678, he proposed some hints for the improvement of this machine, on which remarks were made in the Journal des Sçavans. To him succeeded Dr. Halley, whose bell may be sufficiently understood from the following account. It was made of wood, containing about sixty cubic feet in its concavity, and was the form of a truncated cone, whose diameter at the top was three feet, and at the bottom five. It was so loaded with lead that it would go down in a perpendicular direction and no other. In the top was a window to let in light, and likewise a cock to let out the hot air that had been breathed; and below, about a yard under the bell, was a stage suspended by three ropes, each of which was charged with about one hundred weight to keep it steady. To supply air, the bell had a couple of barrels so cased with lead as to sink when empty, each having a bung-hole in its lowest part to let in the water as the air in them condensed on their descent, and to let it out again when they were drawn up full from below. To a hole in the uppermost part of these was fixed a leathern trunk or hose, long enough to fall below the bung-hole, and kept down by a weight in such a way that the air in the upper part of the barrels could not escape, unless the lower ends of these hose were first lifted up. These air barrels were made to rise and fall like two buckets in a well, by means of these barrels fresh air was continually supplied from above, and it was done with so much ease, that two men with less than half their strength could perform all the labour required. By an additional contrivance it was found practicable for a diver to go out of the engine to some distance from it, the air being conveyed to him in a continual stream by small flexible pipes.

A great improvement in the diving-bell was made by the late Mr. Spalding, of Edinburgh. This construction seems designed to remedy some inconveniences of Dr. Halley's, which are very evident, and of a very dangerous tendency. These are, 1. By Dr. Halley's construction, the sinking or raising of the bell depends entirely on the people who are at the surface of the water; and as the bell even when in the water has a very considerable weight, the raising it not only requires a great deal of labour, but there is a possibility of the rope breaking by which it is raised, and thus every person in the bell would inevitably perish. 2. As there are, in many parts of the sea, rocks which lie at a considerable depth, the figure of which cannot possibly be perceived from above, there is danger that some of their ragged prominences may catch hold of one of the edges of the bell in its descent, and thus overset it before any signal can be given to those above, which would infallibly be attended with the destruction of the people in the bell; and as it must always be unknown, before trial, what kind of a bottom the sea has in any place, it is plain, that without some contrivance to obviate this last danger, the descent in Dr. Halley's diving-bell is not at all eligible.

How these inconveniences are remedied by Mr. Spalding's new contrivance, will be easily understood from the following description. A B C D, Pl. 58, fig. 1. represents a section of the bell, which is made of wood; *e*, *e*, are iron hooks, by means of which it is suspended by ropes QBF *e*, and QAE *e*, and QS, as expressed in the figure: *c*, *c*, are iron hooks, to which are appended leaden weights, that keep the mouth of the bell always parallel to the surface of the water, whether the machine taken altogether is lighter or heavier than an equal bulk of water. By these weights alone, however, the bell would not sink: another is therefore added, represented at L, and which can be raised or lowered at pleasure, by means of a rope passing over the pulley *a*, and fastened to one of the sides of the bell at M. As the bell descends, this weight, called by Mr. Spalding the balance-weight, hangs down a considerable way below the mouth of the bell. In case the edge of the bell is caught by any obstacle, the balance-weight is immediately lowered down so that it may rest upon the bottom. By this means the bell is lightened, so that all danger of oversetting is removed; for being lighter, without the balance-weight, than an equal bulk of water, it is evident that the bell will rise, as far as the length of the rope affixed to the balance-weight will allow it. This weight, therefore, will serve as a kind of anchor to keep the bell at any particular depth which the divers may think necessary; or by pulling it quite up the descent may be continued to the very bottom.

By another very ingenious contrivance, Mr. Spalding rendered it possible for the divers to raise the bell, with all the weights appended to it, even to the surface, or to stop at any particular depth, as they think proper; and thus they could still be safe, even though the rope, designed for pulling up the bell was broken. For this purpose the bell is divided into two cavities, both of which are made as tight as possible. Just above the second bottom EF, are small slits in the sides of the bell, through which the water, entering as the bell descends, displaces the air originally contained in its cavity, which flies out at the upper orifice of the cock GH. When this is done, the divers turn the handle G, which stops the cock; so that if any more air was to get into the cavity AEFB, it could no longer be discharged through the orifice H as before. When this cavity is full of water the bell sinks; but when a considerable quantity of air is admitted it rises. If therefore the divers have a mind to raise themselves, they turn the small cock G, by which a communication is made between the upper and under cavities of the bell. The consequence of this is, that a quantity of air immediately enters the upper cavity, forces out a quantity of the water contained in it, and thus renders the bell lighter by the whole weight of the water which is displaced. Thus, if a certain quantity of air is admitted into the upper cavity the bell will descend very slowly; if a greater quantity, it will neither ascend nor descend, but remain stationary; and if a larger quantity of air be still admitted it will rise to the top. It is to be observed, however, that the air which is thus let out into the upper cavity must be immediately replaced from the air-barrel; and the air is to be let out very slowly, or the bell will rise to the top with so great velocity that the divers will be in danger of being shaken out of their seats. But by following these directions every possible accident may be prevented, and people may descend to very great depths without the least apprehension of danger. The bell also becomes so easily manageable in the water, that it may be conducted from one place to another by a small boat with the greatest ease, and with perfect safety to those who are in it.

Instead of wooden seats used by Dr. Halley, Mr. Spalding made use of ropes suspended by hooks *bbb*; and on these ropes the divers may sit without any inconvenience. There are two windows made of thick strong glass, for admitting light to the divers. N represents an air-cask with its tackle, and OCP the flexible pipe through which the air is admitted to the bell. In the ascent and descent of this cask the pipe is kept down by a small appended weight, as in Dr. Halley's machine. R is a small cock by which the hot air is discharged as often as it becomes troublesome. Annexed is a representation of the whole diving apparatus, which, no doubt, will be readily understood without any further explanation. Two air-barrels are represented in this figure; but Mr. Spalding was of opinion that one, capable of containing thirty gallons, is sufficient for an ordinary machine.

Mr. Adam Walker recommends, for the purposes of diving, a conical tub of wood three feet diameter at the bottom, two and a half feet at the top, and three feet high, so loaded with lead at the bottom as just to sink itself, with a small seat for the diver. (See Plate 58, fig. 3.) A bent metal tube is attached to the outside of the bell, as *abc*, with a stop-cock *a*, and a flexible leathern tube to the other end at *c*; this tube terminates in a forcing air-pump fastened to the side of a ship; *d* is a solid piston acted upon by a lever *e*; upon the piston being drawn up the air rushes in at the valve *g*, and fills the space *n*; in its descent the valve *g* shuts, and the conical valve *o* opens, and thus the air is forced down the hose into the bell. The pump is kept working, while the diver, by opening and shutting the stop-cock, is abundantly supplied with fresh air, and that which is vitiated is forced out at the bottom of the bell. By a machine of this kind, the greatest part of the wreck was saved from the rich ship Belgiosa.

Mr. Smeaton's diving-bell was a square chest of cast-iron, four and a half feet in height, four and a half feet in length, and three feet wide, and afforded room for two men to work in it. It was supplied with fresh air by a forcing-pump. This was used with great success at Ramsgate.

Several other machines have been contrived to answer the purposes of the diving-bell; one of which, fig. 4, was invented in 1753, by —— Rowe, esq. and published in the Universal Magazine.

The engine is a trunk, or hollow vessel, of copper or brass, of sufficient strength to resist the pressures of deep waters, and dimensions to contain the body of a man, supposed to enter therein feet foremost at *i*, bent at the bearing of his knees, at *l*, for the more convenient going between rocks and great stones; at *k*, and on the other side, are holes for his arms to pass through, and a glass for his sight at *n*. *h* represents a sleeve made of soft leather, lined with fine cloth, exactly to fit the diver, and fastened to the body of the engine at *k*, where the arms come through; which is likewise defended by a soft quilting, to prevent the arms from being hurt by pressure, and the sleeves from being thrust into the engine; *dd* represents a cover to fit the head of the engine, fastened down with screws, and leather between the borders, so as to prevent leaking in any depth of water; *ab* represents a plate of lead, to be fastened before the engine, in a straight line, passing between the arms, not only as a proper weight to sink the engine, but as a balance thereto; whereby the diver will always be kept in a proper posture for working, and the more so by means of a block, or cradle, supposed to be fastened over the lead, by which means the diver has not only the power of handling what is at the bottom, but may at any time rest his arms from work; *g* is the engine rope by which it is let down and hauled up again from the bottom; *zyu* is called the life-line, with a knot at *y*, so as the handle at *z* may always remain at a due distance for the diver to take hold thereof, in order to give any notice to the persons above, as, by agreement, by giving a certain number of pulls, or sudden twitches, which is immediately felt by the person that holds the line. The diver can tarry under water at least half an hour at one time, without the help of pipes, or any other air than what the engine contains. At *i* and *w* are two brass screw caps, or plugs, both which are to be opened as soon as the diver gets from the bottom to the water's surface, in order to give him fresh air by help of a pair of bellows blowing at the latter; at which, when the engine leaks, we likewise pump out the water. In deep water the diver is forced to make use of a saddle on his back, with a ridge touching the upper part of the engine, whereby he can keep his arms at a due distance out of the engine, which otherwise would be thrust in by the column of water pressing thereon.

The apparatus contrived by Mr. Tonkin to raise property from the Abergavenny East-India ship, has been described in the Monthly Magazine, as below.

The machine itself is expressed in the engraving, Pl. 58. by the figure 2, and consists of a body of copper with iron boots and joints, as in coats of mail. The whole is then covered with leather, and afterwards with canvas painted white, to distinguish it in the water. The arms are made of strong, water-proof leather, and the place for sight is about eight inches diameter, and glazed with glass an inch thick. The diver, Mr. Braithwaite, is sunk in this machine by means of weights fastened equatorially round the waist of the machine, and he is suspended by the rope, 3, by means of which his situation is changed at pleasure.

4. is an air tube communicating with the vessel above, by means of which the diver gives his instructions, and obtains his supply of air.

1. represents the hull of the Abergavenny, as she lies in ten fathoms water, near the Isle of Portland.

5 represents the men who communicate with the diver, and act under his instructions.

6. represents the men raising a box from the wreck by means of forceps.

7. the power of which increases with the weight which is to be raised.

8. represents men on a raft sawing the decks, and making way for the operations of the diver; and 9. is the saw.

DIVI'NITY. *s.* (*divinité*, French; *divinitas*, Latin.) 1. Participation of the nature and excellence of God; deity; godhead (*Stillingfleet*). 2. God; the Deity; the supreme Being; the Cause of causes. 3. False god (*Prior*) 4. Celestial being (*Cheyne*). 5. The science of divine things; theology (*Shakspeare*). 6. Something supernatural (*Shakspeare*).

DIVI'SIBLE. *a.* (*divisibilis*, Latin.) Capable of being divided into parts, separable (*Bent*).

DIVISIBI'LITY. *s.* (*divisibilité*, French.) The quality of admitting division or separation of parts (*Glanville*).

The word divisibility, restrained to its simple signification, presents no idea that is not perfectly known, since all bodies have parts which are readily conceived to be separable, the one from the other. But is matter itself really divisible to infinity, so that its division does not admit of any possible limits? or rather, is it constituted, in the ultimate result, of indivisible molecules that must be regarded as simple? Here springs a new source of interminable discussions between the partisans of the two opinions, wherein the human mind has exercised all its subtilty to find arguments in favour of each, and to oppose difficulties to the other: What are called mathematical demonstrations of the *infinite* divisibility of matter, fail in their object; they merely prove the infinite divisibility of extension, in a geometrical sense. Thus, after having disputed much, and written much, all on the subject of an atom, it is not at all advanced; and indeed the solution of the question itself would not give one step to the progress of science. Let us then banish from natural philosophy all questions so unfruitful, as they respect the progress of our knowledge. Instead of enquiring whether bodies admit of infinite division, we would analyse them, as far as is consistent with our own powers; and would deduce from the analyses such knowledge as will diffuse light over facts previously regarded as inexplicable. It has been wisely remarked, that the bounds of experience and of observation are, in relation to us, those of nature itself.

It is, however, certain with respect to the division of bodies, that in the result parts are separable the one from the other, the minuteness of which surpasses the imagination. In proof of this, we may first mention colouring substances, and particularly carmine, which is a kind of powder obtained from the insect, commonly called cochineal. Dilute a small quantity of this powder, to the weight of about $\frac{3}{4}$ of a grain, by putting it at the bottom of a vessel, in which is afterward poured nearly 30 pounds of water: the colour will be so diffused as to be perceptible throughout the whole volume of the water. The weight of this water being three hundred thousand times greater than that of five centigrammes of carmine, if it be supposed that each centigramme of the fluid mixture contains only two moleculæ of the colouring principle, there will be three millions of visible parts in five centigrammes of carmine.

The impressions made upon the sense of smelling are not less proper than those which affect the sight, in assisting to judge of the extreme divisibility of which matter is susceptible. There are bodies whose weight is scarcely sensibly altered after a long interval of time, during which, all those who are found within a certain distance incessantly experience the action of the odoriferous particles emanated from the substance of these bodies.

There is taken from a bag, contained in the bodies of certain animals, a substance, to which has been given the name of musk, and of which a single grain will send forth a strong odour, during a certain number of years, in an apartment into which fresh air is frequently admitted. The simple friction of a paper, in which a small portion of the same substance has been wrapped, will suffice to make a habit impart a fragrant smell for several days.

Some operations in the arts will furnish a much more just idea of the same property, because their results are susceptible of being reduced to calculation. According to the observations of Boyle, the weight of a grain of gold, or about 53 milligrammes, reduced to leaves, will cover a surface of 50 square inches; each of which will, of consequence, measure nearly 27 millimetres across; but we may conceive the millimetre (about $\frac{1}{25}$ of an inch) divided into eight visible parts; this will give 46656 little visible squares in a square leaf of gold, each side of which measured 27 millimetres; and, as the number of these leaves is 50, we may conclude that a small mass of gold, weighing only a grain, may be divided into more than two millions of parts, each perceptible to the simple sight; but, by means of a microscope, each of these parts would become as it were a leaf of gold, where the eye and the computation would still find subjects for their exercise.

This division proceeds much farther still, in the labour of wire-drawing gold. Take a certain quantity of leaf gold, in weight not exceeding three decigrammes, or about an ounce, and cover with it a cylinder of silver. Cause this covered cylinder to pass successively through several holes in a wire-drawing iron; and, when it is reduced to a thread as delicate as a hair, it will be covered on all its points by an extremely thin coat of gold; then let the wire be flattened between two steel rollers. In this state it will form a plate, in length nearly equal to 111 leagues, each of 2000 toises. But this plate being clothed with a covering of gold on each of its faces, may be considered as two plates of gold of an extreme tenuity, and placed mentally one at the end of the other. Moreover, the breadth of the lamina being about $\frac{1}{4}$ of a line, we may suppose this breadth divided into two, and thus the quantity of gold employed is equivalent to four plates, the length of each of which is about 444000 metres. Now if it be imagined, that each of the millimetres comprised in this length is divided into eight parts, we shall have more than 14 billions of visible parts, in a mass of gold weighing only an ounce, and which is equivalent to a cube of gold whose side is not more than 12 millimetres, or $5\frac{1}{3}$ lines in length.

This prodigious extension of which gold is susceptible depends upon its ductility, combined with its great density; two qualities equally precious for those arts whose object is to apply this metal upon the surface of wood, copper, and other substances, where it serves at once both for security and for ornament.

We shall add another example, drawn from the stony substance known by the name of *mica*, and which yields, with great facility, to the operation called *mechanical division*. We have succeeded in detaching, from the original piece, a plate, which, instead of the yellowish colour natural to the stone, reflected a fine blue, which, as we shall explain when treating of light, indicated an extreme degree of tenuity. Having calculated the thickness of this plate, after a rule marked out by Newton, and which we shall then also make known, we found it equal to 43-millionths of a millimetre, or about 1·6-millionth of an inch; hence it follows, that we might obtain 23255 isolated plates, by dividing a piece of mica of the thickness of a millimetre, or $\frac{4}{9}$ of a line.

We cannot better terminate this article than by exhibiting a very judicious notion derived by Newton from the system of Epicurus, relative to the limits prescribed to the division of bodies in the actual state of things. This great philosopher conceives that the Supreme Being, in creating matter, formed it of various species of elementary molecules, solid, hard, unchangeable, the figures and the different qualities of which were appropriated to the respective ends they were proposed to answer. But such is the fixity of these molecules, that no process of art, nor even any force existing in nature, can either divide or alter them, unless the essence of the body should be changed with time. Thus all the modifications experienced by bodies depend solely upon this, that these durable molecules separate the one from the other, and then become reunited, in various ways forming new combinations. These different molecules are, hence, the simple substances of chemistry; and the results of the operations which they would present singly, should be the design of the efforts of this science; in the mean time we may consider as simple the substances which we have not yet been able to decompose, and wisely imagine simplicity to reside at the place where observation stops. The curious reader may consult farther, Good's translation and notes on Lucretius, Book II., Watts's Remnants of Time improved, sect. 13., and Keill, Introduct. ad Ver. Phys. Lect. 3, 4, and 5.

DIVISI'BLENESS. *s.* Divisibility.

DIVI'SION. *s.* (*divisio*, Latin.) 1. The act of dividing any thing into parts. 2. The state of being divided (*Esdras*). 3. That by which any thing is kept apart; partition. 4. The part which is separated from the rest by dividing (*Addison*). 5. Disunion; discord; difference (*Decay of Piety*). 6. One of the parts into which a discourse is distributed (*Locke*). 7. Space between the notes of music; just time (*Shakspeare*). 8. Distinction (*Exodus*). 9. Subdivision; distinction of the genera into species (*Shakspeare*).

DIVISION, in arithmetic, the separating or parting of any number or quantity given, into any parts assigned. Division may be considered under four different senses; 1. By it we find, how often one number is contained in another. 2. What part of the dividend the divisor is equal to. 3. What number or quantity is contained as often in the dividend as unity is in the divisor. And 4. What number is such a part of the dividend as the divisor denominates. Under one or other of these senses, division is always understood in arithmetic and algebra. For modes of operation, see the treatises on ARITHMETIC and ALGEBRA, in the first vol. of this work.

DIVISION OF REPETENDS, may be readily performed by these rules. 1. If the repetends in the divisor and dividend are both similar and conterminous, and have no terminate parts, divide them as finite decimals. 2. If they are not similar, make them to begin and end together; then, if there are any terminate parts in the divisor or dividend, or both, subtract them, and the remainders will be a new divisor and dividend, which divide as finite numbers.

Ex. Divide 27·963723 by 35·6

Divisor 35·600000 made similar

From	35·600000	27·963723	
Sub. ter. part	356	269	
New div.	35·599644	27·963444	·78549 Quo.
Rem. same as div.		27963444	

DIVISION OF POWERS, is performed by subtracting their exponents. Thus, $a^6 \div a^4$ is $= a^2$; and $4a^{\frac{3}{4}}b^2 \div 2a^{\frac{1}{2}}b^{\frac{4}{3}}$ is $= 2a^{\frac{1}{4}}b^{\frac{2}{3}}$.

DIVISION BY LOGARITHMS. See LOGARITHMS.

DIVISION OF ALGEBRAIC FRACTIONS. See FRACTIONS.

DIVISION OF MATHEMATICAL INSTRUMENTS. See GRADUATION.

DIVISION OF SURDS. See SURDS.

DIVISION OF CONCORDS. See CONCORDS.

Division of proportion. See Proportion.

Divisions of an army, in the military art, the several brigades and squadrons into which it is cantoned.

Divisions of a battalion, are the several platoons into which it is divided in marching or firing, each of which is commanded by an officer.

Division, in sea affairs, a select number of ships in a fleet or squadron of men of war, distinguished by a particular flag or pendant, and usually commanded by a general officer. A squadron is commonly ranged into three divisions, the commanding officer of which is always stationed in the centre.

DIVISOR, in arithmetic and algebra, is the dividing number, or that which shews how many parts the dividend is divided into.

Divisor (Common). See Common measure.

Divisors (Method of), a method first used by sir Isaac Newton, to discover the roots of equations. This method is founded upon the principle that the last term of an equation is the product of all the roots with their signs changed: so that if any root be a whole number it may be found among the divisors of the last term. The number of trials may, according to this method, be lessened by substituting three or more terms of the arithmetical progression 2, 1, 0, — 1, 2 &c. for the unknown quantity, and forming the divisors of the results, taken in order, into arithmetical progressions, in which the common difference is unity; as it will only be necessary to try those divisors of the last term of the equations which are terms in these progressions.

Ex. Let $x^4+x^3-29x^2-9x+180=0$, be the equation proposed. Then substituting successively the terms of the progression, 2, 1, 0,—1, &c. instead of x, the work will stand as follows:

Ist. Pro	Results	Divisors.	Progressions.			
2	70	1 . 2 . 5 . 7 . 10 . 14. &c.	1	2	5	7
1	144	1 . 2 . 3 . 4 . 6 . 8. &c.	2	3	4	6
0	180	1 . 2 . 3 . 4 . 5 . 6. &c.	3	4	3	5
—1	160	1 . 2 . 4 . 5 . 8 . 10. &c.	4	5	2	4
—2	90	1 . 2 . 3 . 5 . 6 . 9. &c.	5	6	1	3

Here are four progressions, of which we take the terms standing in the same line with the 0, and placing the negative sign before such as are taken from decreasing progressions, we have 3, 4,—3, & —5, each of which being substituted for x, makes the whole equation vanish: these, therefore, are the roots sought. More examples may be seen in Newton's, Maclaurin's, Bonnycastle's and Wood's Algebra.

DIVORCE, a breach or dissolution of the bond of marriage. (See Marriage and Law.) Divorce is of two kinds: the one, *a vinculo matrimonii*, which alone is properly *divorce*; the other, *a mensa et thoro*, "a separation from bed and board." The woman divorced *a vinculo matrimonii* receives all again that she brought with her: the other has a suitable separate maintenance allowed her out of her husband's effects. The first only happens through some essential impediment, as consanguinity or affinity within the degrees forbidden, pre-contract, impotency, adultery, &c. of which impediments the canon law allows 14. Divorce is a spiritual judgment, and therefore is passed in the spiritual court. Under the old law, the woman divorced was to have of her husband a writing, as St. Jerom and Josephus testify, to this effect: *I promise, that hereafter I will lay no claim to thee*; which was called a *bill of divorce*. Divorce was allowed of in great latitude both among the Pagans and Jews. At Rome, barrenness, age, disease, madness, and banishment, were the ordinary causes of divorce.

The Roman lawyers distinguish between *repudium* and *divortium*; making the former to be the breaking of a contract of espousal, and the latter separation after matrimony. Romulus enacted a severe law, which suffered not a wife to leave her husband, but gave the man the liberty of turning off his wife, for certain causes: however, in later times, the women as well as the men might sue a divorce. The common way of divorcing was by sending a bill to the woman, containing the reasons of separation, and the tender of all her goods which she brought with her: and this was called *repudium mittere*; or else it was performed in her presence, and before seven witnesses. and accompanied with the formalities of tearing the writings, refunding the portion, taking away the keys, and turning the woman out of doors.

The Grecian laws concerning divorces were different: The Cretans allowed divorce to any man that was afraid of having too many children. The Spartans seldom divorced their wives; and it was extremely scandalous for a woman to depart from her husband. The Athenians allowed divorce on very small grounds, by a bill, containing the reason of the divorce, and approved, if the party appealed, by the chief magistrate; and women also were allowed to leave their husbands on just occasions. Persons divorcing their wives were obliged to return their portions; otherwise, the Athenian laws obliged them to pay nine oboli a month for alimony. The terms expressing the separation of men and women from each other were different; the men were said *αποπεμπειν* or *απολυειν*, to dismiss their wives; but wives ἀπολείπειν, to leave their husbands.

"The law of Moses (says Paley), for reasons of local expediency, permitted the Jewish husband to put away his wife; but whether for every cause, or for what cause, appears to have been controverted amongst the interpreters of those times. Christ, the precepts of whose religion were calculated for more general use and observation, revokes this permission, as given to the Jews 'for their hardness of heart,' and promulges a law which was thenceforward to confine divorces to the single cause of adultery in the wife: Mat. xix. 9.

"Inferior causes may justify the separation of husband and wife, although they will not authorise such a dissolution of the marriage contract as would leave either at liberty to marry again: for it is that liberty in which the danger and mischief of divorces principally consist. The law of this country, in conformity to our Saviour's injunction, confines the dissolution of the marriage contract to the single case of adultery in the wife; and a divorce even in that case can only be brought about by the operation of an act of parliament, founded upon a previous sentence in the spiritual court, and a verdict against the adulterer at common law: which proceedings, taken together, compose as complete an investigation of the complaint as a cause can receive." It has been proposed to the legislature to annex a clause to these acts, restraining the offending party from marrying with the companion of her crime, since the crime may be committed with that view; and it is also worth considering, whether a law might not be framed, directing the fortune of the adulteress to descend as in case of her natural death; reserving, however, a certain annuity from the produce of it, for her subsistence; and also so far suspending the estate in the hands of the heir, as to preserve the inheritance to any children she might bear to a second marriage, in case there was none to succeed in the place of their mother by the first. (See Paley's moral and political philosophy.) The sentences of our ecclesiastical courts, which release the parties *a vinculo matrimonii*, for impuberty, frigidity, consanguinity within the prohibited degrees, prior marriage, or want of the consent of parents or guardians, are not dissolutions of marriage, but judicial declarations that there never was any marriage; such impediment subsisting at the time as rendered the celebration of the marriage rite a mere nullity; and, indeed, the rite itself contains an exception of these impediments.

To DIVO'RCE. *v. a.* (from the noun.) 1. To separate a husband or wife from the other. 2. To force asunder; to separate by violence (*Waller*). 3. To separate from another (*Hooker*). 4. To take away; to put away (*Shakspeare*).

DIVO'RCEMENT. *s.* (from *divorce.*) Divorce; separation of marriage (*Deuteronomy*).

DIVO'RCER. *s.* (from *divorce.*) The person or cause which produces divorce or separation (*Drummond*).

DIURE'SIS. (*diuresis*, διουρησις; from δια, through, and ῥεω, to flow.) An increased secretion of urine. (See DIABETES).

DIURETICS. (*diuretica, medicamenta*, διουρητικα; from διουρησι, a discharge of urine.) Medicines or substances which, when taken internally, augment the flow of urine from the kidneys. This class of medicines comprehends three orders: 1. Stimulating diuretics, as squills, colchicum, and cantharides, which are best calculated for the aged, the lax, the phlegmatic, and those with highly diminished sensibility. 2. Refrigerating diuretics, as the acetosa, acetum, kali acetatum, and cremor tartar; the constitutions in which these are chiefly preferable to others are, the young, the sanguine, and those of remarkable sensibility. 3. Diluent diuretics, as water, acidulated water, and whey, which are well adapted for constitutions whose serosity appears to be deficient, and in which there is a high degree of inanition.

DIU'RIS. In botany, a genus of the class gynandria, order dyandria. Nectary dependent; petals nine, the five outer ones very large, of two shapes; column of the fructification reversed, with a lid at the top. One species only, found wild in Andalusia; a beautiful plant, with leafy scape at the base, and racemed spathaceous flowers

DIU'RNAL. *a.* (*diurnus*, Latin.) 1. Relating to the day (*Brown*). 2. Constituting the day (*Prior*). 3. Performed in a day; daily: quotidian (*Milton*).

DIURNAL MOTION OF A PLANET; so many degrees and minutes, &c. as any planet moves in twenty-four hours.

DIURNAL MOTION OF THE EARTH (The), is its rotation round its axis, the space whereof constitutes the natural day.

The reality of the diurnal rotation of the earth is now past all dispute.

DIURNAL is also used in speaking of what belongs to the nycthemeron, or natural day of twenty-four hours. In which sense it stands opposed to annual, menstrual, &c. The diurnal phænomena of the heavenly bodies are solved from the diurnal revolution of the earth; that is, from the revolution of the earth round its own axis in twenty-four hours. This rotation is equable, and from west to east; about an axis whose inclination to the ecliptic is nearly 66½°. That small part of the earth's surface which is at once under the view of a spectator seems like an extended plane: and the eye taking a view of the heavens all around defines a concave spherical superficies, concentric with the earth, or rather with the eye, divided by the horizontal plane into two equal parts, the one of which is visible; but the other, by reason of the earth's opacity, hid from the view. As the earth revolves about its axis, the spectator standing upon it, together with his sensible horizon, dividing the visible from the invisible hemisphere of the heavens, is carried round the same way, viz.

towards the east. Hence it is, that the sun and stars, placed towards the east, being before hid, now become visible; the horizon, as it were, sinking below them; and the stars, &c. towards the west, become invisible, the horizon being elevated above them. So that the former stars, to the spectator, who reckons the place he stands on as immoveable, will appear to ascend above the horizon, or rise; and the latter to descend below the horizon, or, to set. Since the earth, with the horizon of the spectator fixed to it, continues to move always towards the same parts, and about the same axis equally; all bodies, and all phenomena, that do not partake of the said motion, (that is, all such things as are entirely separate from the earth) will seem to move in the same time uniformly, but towards the opposite parts, or from east to west: and every one of these objects, according to sense, will describe the circumference of a circle, whose plane is perpendicular to the axis of the earth. And because all these circles, together with the visible objects describing them, appear to be in the concave spherical superficies of the heavens, every visible object will seem to describe a greater or less circle, according to its greater or less distance from the poles, or extremities of the earth's axis produced; the middle circle between these poles called the equator, is consequently the greatest. (*Hutton's Dictionary*).

Diu'rnal. s. (*diurnal*, French. A journal; a day book.

DIU'RNALLY. *ad.* (from *diurnal.*) Daily; every day (*Tatler*).

DIU'RNITY. *s.* (*diuturnitas*, Latin.) Length of duration (*Brown*).

To **DIVU'LGE.** *v. a.* (*divulgo*, Latin.) 1. To publish; to make publick (*Hooker*). 2. To proclaim (*Milton*).

DIVU'LGER. *s.* (from *divulge.*) A publisher, one that exposes to publick view (*K. Charles*).

DIVU'LSION. *s.* (*divulsio*, Latin.) The act of plucking away (*Brown*).

DIVUS, Diva, in antiquity, appellations given to men and women who had been deified, or ranked among the gods.

DIXAN, the first town in Abyssinia, on the side of Taranta. It is built on the top of a conical hill, having a road winding spirally up to it from the valley below. Lat. 14. 57 N. Lon. 40. 7 E.

DIXMUNDE, a town in Austrian Flanders, celebrated for its excellent butter. Lat. 51. 3 N. Lon. 2. 57 E.

To **DI'ZEN.** *v. a.* (from *dight.*) To dress; to deck: a low word (*Swift*).

DI'ZZARD. *s.* (from *dizzy.*) A blockhead; a fool.

DI'ZZINESS. *s.* (from *dizzy.*) Giddiness; whirl in the head (*Glanville*).

DI'ZZY. *a.* (ꝺiꞅiᵹ, Saxon.) 1 Giddy; vertiginous (*Milton*). 2. Causing a giddiness (*Shakspeare*). 3. Giddy; thoughtless (*Milton*).

To **Di'zzy.** *v. a.* To whirl round; to make giddy (*Shakspeare*).

DNIEPER, or **Nieper,** a large river of Europe, formerly called the Boristhenes; it rises in the midst of Muscovy, and after passing by Kiow, Oczakow, and other places, it falls into the Black sea between Cherson and Oczakow. Its whole course is about 100 miles.

DNIESTER (the ancient Tyras), a fine river, which rises in Galicia, in Austrian Poland, and visits Chockzim, dividing Podolia from Moldavia; it then separates Bessarabia from the Russian government of Catharinenslaf, and having watered Bender, falls into the Black Sea, between the mouths of the Danube.

To **DO.** *v. a.* Thou *dost*, he *doth* or *does*; preter. *did*; part. pass. *done.* (ꝺon, Saxon.) 1. To practise or act any thing good or bad. 2. To perform; to achieve (*Collier*). 3. To execute; to discharge (*Shakspeare*). 4. To cause: obsolete (*Spenser*). 5. To transact (*Acts*). 6. To produce any effect to another (*Swift*). 7. To have recourse to; to practise as the last effort (*Jeremiah*). 8. To perform for the benefit or hurt of another (*Samuel*). 9. To exert; to put forth (*Timothy*). 10. To manage by way of intercourse or dealing; to have business (*Rowe*). 11. To gain; to effect by influence (*Bacon*). 12. To make any thing what it is not (*Shakspeare*). 13. To finish; to end (*Duppa*) 14. To conclude; to settle (*Tillotson*). 15. To put (*Shakspeare*). 16. The phrase, *what to* do *with*, signifies how to bestow; what use to make of; what course to take; how to employ; which way to get rid of (*Tillotson*).

To **Do.** *v. n.* 1. To act or behave in any manner well or ill (*Temple*). 2. To make an end; to conclude (*Spectator*). 3. To cease to be concerned with; to cease to care about (*Stillingfleet*). 4. To fare; to be with regard to sickness or health (*Shakspeare*). 5. To succeed, to fulfil a purpose (*Collier*). 6. *To* Do is used for any verb, to save the repetition of the verb: as, *I shall come*; *but if I* do *not, go away*; that is, *if I* come *not*. 7. *Do* is a word of vehement command, or earnest request: as, *help me*, do, *make haste*, do. 8 *To* Do is put before verbs sometimes expletively: as, *I* do *love*, or, *I love*; *I* did *love*, or, *I loved*. 9. Sometimes emphatically: as, *I* do *hate him, but will not wrong him*. 10. Sometimes by way of opposition: as, *I* did *love him, but scorn him now*.

Do, in the Italian music, is a syllable used instead of *ut*, being supposed more resonant and musical.

DOBCHICK, in ornithology. See Colymbus.

DOBRZIN, a town of Poland, in Masovia, capital of a territory of the same name. Lat. 52. 54 N. Lon. 19. 5 E.

DO'CIBLE. *a.* (*docilis*, Latin.) Tractable; docile; easy to be taught (*Milton*).

DO'CIBLENESS. *s.* (from *docible.*) Teachableness; docility (*Walton*).

DO'CILE. *a.* (*docilis*, Latin.) Teachable; easily instructed; tractable (*Ellis*).

DOCI'LITY. *s.* (*docilité*, French; *docilitas*, Latin.) Aptness to be taught; readiness to learn (*Grew*).

DOCIMASIA. (from δοκιμαζω, I try). A custom among the Athenians, by which every man before he was admitted to a public employment, was obliged to give an account of himself, and his past life. It was done publicly in the forum.

DOCIMASTIC ART. Ars docimastica. The art of examining fossils, in order to discover what metals, &c. they contain.

DOCIMENTUM MARMOR, a name given by the ancients to a species of marble, of a bright and clear white, much used in large and sumptuous buildings, as temples, &c.

DOCK, in botany. See Rumex.

Dock-cresses. See Lamprana.

Dock, in maritime affairs, is an artificial bason, by the side of an harbour, made convenient either for the building or repairing of ships. It is of two sorts, 1. Dry-dock, where the water is kept out by great flood-gates, till the ship is built or repaired, when the gates are opened, and the water let in to float or launch her. 2. Wet-dock, a place where the ship may be hauled into, out of the tide's way, and so dock herself, or sink herself a place to lie in.

Dock (London), &c. See London.

Dock-yards, are magazines of all sorts of naval stores and timber, with all the requisite machinery, &c. for ship-building, which is there carried on. The royal dock-yards in England are those at Chatham, Portsmouth, Plymouth, Woolwich, Deptford, and Sheerness. In time of peace ships of war are laid up in these docks; those of the first rates mostly at Chatham, where, and at other yards, they receive from time to time such repairs as are necessary. The principal dock-yards are governed by a commissioner, resident at the port, who superintends all the musters of the officers, artificers, and labourers, employed in the dock-yard, and ordinary. He also controuls their payments; examines the accounts; contracts and draws bills on the navy-office to supply the deficiency of stores, and regulates whatever belongs to the yard, maintaining due order in the respective offices.

Dock. *s.* 1. The stump of the tail, which remains after docking. 2. The solid part of the tail (*Grew*).

To **Dock.** *v. a.* (from *dock*, a tail.) 1. To cut off a tail. 2. To cut any thing short (*Swift*). 3. To cut off a reckoning. 4. To lay the ship in a dock.

DO'CKET. *s.* A direction tied upon goods; a summary of a larger writing.

DOCKING, in the manage, the operation of amputating a horse's tail, so called from the part of the tail left to the body being denominated the dock. It is a very short and simple operation, attended with no danger, and may with yearlings be performed even with a common knife. The usual quantity taken off is of the width of a man's hand: if there be much discharge of blood a very slight cauterization with a hot iron, and a little powdered rosin, immediately stops the bleeding, and a cure takes place in a few days. It was formerly a custom to dock horses close to the quarters, under the erroneous idea of making the horse strong in the spine; such absurd practice, however, has been relinquished for some years.

DOCKUM, a town of the United Provinces, in West Friesland, at the mouth of the river Ee. Lat. 53. 18 N. Lon. 5. 41 E.

DOCTOR, a person who has passed all the degrees of a faculty, and is impowered to teach or practise the same: thus we say, doctor of divinity, doctor of physic, doctor of laws, &c. The establishment of the doctorate, as now in use among us, is ordinarily attributed to Irnerius, who himself drew up the formulary. The first ceremony of this kind was performed at Bologna, in the person of Bulgarus, who began to profess the Roman law, and on that occasion was solemnly promoted to the doctorate, i. e. installed *juris utriusque doctor*.

To pass doctor in divinity at Oxford, the candidate must have been four years bachelor of divinity. For doctor of laws, he must have been seven years in the university to commence bachelor of law; five years after which he may be admitted doctor. Otherwise; in three years after taking the degree of master of arts, he may take the degree of bachelor in law; and in four years more, that of LL.D., which same method and time are likewise required to pass the degree of doctor in physic. For the necessary time at Cambridge, see Degree.

Doctor of the law, a title of honour among the Jews. The investiture, if we may so say, of this order was performed by putting a key and table-book in the hands; which is what some authors imagine our Saviour had in view, Luke xi. 52. when, speaking of the doctors of the law, he says, "Woe unto you doctors of the law, for you have taken away the key of knowledge: you entered not in yourselves, and them that were entering you hindered."

Doctor of the church, a title given to certain of the fathers whose doctrines and opinions have been the most generally followed and authorised. We usually reckon four doctors of the Greek church, and three of the Latin. The first are St. Athanasius, St. Basil, St. Gregory Nazianzen, and St. Chrysostom. The latter are St. Jerom, St. Augustine, and Gregory the Great.

Doctor in music, a musician upon whom some university has conferred the degree of doctor in the faculty of music. At what time this degree was first instituted in England authors do not agree: Anthony Wood says, it took place as early as the reign of Henry the Second; but Spelman thinks it had no existence till the reign of king John. No name being to be found of the first professor in music to whom this title was granted, we are in want of the very circumstance which would best decide the question, and must, therefore, be satisfied with the conjecture, that its commencement must have been pretty early, since we know it to have been conferred upon Hambois, who flourished towards the beginning of the fifteenth century. It, however, clearly appears, by the qualifications formerly required of a candidate, either for a doctor's or bachelor's degree in music, that at the time of the institution of these degrees music was regarded as a science merely speculative, and that little, if any, stress was laid on skill in composition. The being able to read and expound Boethius was conceived to be a higher criterion of scientific acquisition than any specimens of invented harmony and melody; and an acquaintance with the ratio of musical intervals, and the philosophy of sound, superseded the operations of creative genius and practical theory. The present statutes, however, are formed on a broader principle, and, looking to talent and active science for the necessary qualifications, require of the candidate an exercise in eight vocal parts, with instrumental accompaniments, which he is to submit to the inspection of the music professor, and to have performed in the music-school, or some other place in the university. (*Busby*).

Doctor, is also an appellation affixed to several specific epithets, expressing the merit of some of the schoolmen: thus, Alexander Hales is called the irrefragable doctor; Thomas Aquinas, the angelic doctor; St. Bonaventure, the seraphic doctor; John Duns Scotus, the subtile doctor; Raimond Lully, the illuminated doctor; Roger Bacon, the admirable doctor, &c.

Doctor, Διδάσκαλος, in the Greek church, is a particular officer, appointed to interpret part of the scriptures.

Doctor's commons. See College of Civilians.

To **Do'ctor.** *v. a.* (from the noun.) To physic; to cure: a low word.

DO'CTORAL. *a.* (*doctoralis*, Latin.) Relating to the degree of a doctor.

DO'CTORALLY. *ad.* (from *doctoral.*) In manner of a doctor (*Hakewill*).

DOCTORATE, or **Do'ctorship.** *s.* (from *doctor.*) The rank of a doctor (*Claren.*).

DOCTRI'NAL. *a.* (*doctrina*, Latin.) 1. Containing doctrine (*South*). 2. Pertaining to the act or means of teaching (*Hooker*).

DOCTRI'NALLY *ad.* In the form of doctrine; positively (*Ray*).

DO'CTRINE. *s* (*doctrina*, Latin.) 1. The principles or positions of any sect or master: that which is taught (*Atterbury*). 2. The art of teaching (*Mark*).

DO'CUMENT. *s.* (*documentum*, Latin.) 1. Precept; instruction; direction (*Watts*). 2. Precept, in an ill sense; a precept magisterially dogmatical (*Govern. of the Tongue*).

DODARTIA, in botany, a genus of the class didynamia, order angiospermia. Calyx five-toothed; corol with the lower lip twice as long as the upper; capsule globular, two-celled. Two species; herbaceous and creeping, with yellow flowers: native of Palestine.

DODD (Dr William), an unfortunate English divine, eldest son of the rev. William Dodd, many years vicar of Bourne in Lincolnshire, was born May 29, 1729. He was sent, at the age of 16, to the university of Cambridge; and admitted, in the year 1745, a sizar of Clare-Hall. In 1749-50 he took the degree of B.A. with great honour, being upon that occasion in the list of wranglers. Leaving the university, he imprudently married a Miss Mary Perkins in 1751, was ordained a deacon the same year, priest in 1753, and soon became a celebrated and popular preacher. His first preferment was the lectureship of West-Ham. In 1754 he was also chosen lecturer of St Olave's, Hart-street; and in 1757 took the degree of M.A. at Cambridge. On the establishment of the Magdalen Hospital in 1758, he was a strenuous supporter of that charity, and soon after became preacher at the chapel of it. By the patronage of bishop Squire, he in 1763 obtained a prebend of Brecon, and, by the interest of some city-friends, procured himself to be appointed one of the king's chaplains; soon after which, he had the education of the present earl of Chesterfield committed to his care. In 1766 he went to Cambridge, and took the degree of LL.D. At this period, the estimation in which he was held by the world was sufficient to give him expectations of still higher preferment, and hopes of greater riches and honours, and these he might probably have acquired, had he possessed a common portion of prudence and discretion. But, impatient of his situation, and eager for advancement, he rashly fell upon means which in the end were the occasion of his ruin. On the living of St. George, Hanover-square, becoming vacant, he wrote an anonymous letter to the lord chancellor's lady, offering 3000 guineas if by her assistance he was promoted to it. This being traced to him, complaint was immediately made to the king, and Dr. Dodd was dismissed with disgrace from his office of chaplain. From this period he lived neglected, if not despised; and his extravagance still continuing, he became involved in difficulties, which tempted him to forge a bond from his late pupil lord Chesterfield, Feb. 4, 1777, for 4200l., which he actually received: but being detected, he was tried at the Old Bailey, found guilty, and received sentence of death; and, in spite of every application for mercy, was executed at Tyburn, June 27, 1777. Dr. Dodd was a voluminous writer, and possessed considerable abilities, but not much judgment. An accurate list of his various writings is prefixed to his Thoughts in Prison, ed. 1781.

DODDER, in botany. See Cuscuta.

DODDERED. *a.* (from *dodder.*) Overgrown with dodder.

DODDRIDGE (Philip), D.D. an eminent English divine. He descended from a very respectable family: his great grandfather's brother was sir John Doddridge, one of the judges of the court of King's Bench. The subject of this article was the son of Daniel Doddridge, an oilman in London, where he was born June 26, 1702. Having completed the study of the classics at several schools, he was in Oct. 1719, placed under the tuition of the rev. Mr. John Jennings, who kept an academy at Kibworth, in Leicestershire, and was a gentleman of great learning, piety, and usefulness. In 1722, Mr. Jennings removed, with his pupils, from Kibworth to Hinckley, where Doddridge preached his first sermon. In June 1723 he was first settled as a minister to the congregation of dissenters of the independent persuasion at Kibworth. In this obscure village he continued rather more than two years, when he removed his residence to Market Harborough; and on Mr. Jennings's death in 1729, succeeded to the care of a similar academy. On Dec. 24th the same year, Mr. Doddridge removed with his academy from Harborough to Northampton, where he was chosen minister of a large congregation. At this place he resided till about July 1751, and assiduously attended to the discharge of his duties as a minister of the gospel, while at the same time he diligently pursued his private studies, and regularly and faithfully applied to the instruction of his numerous pupils. He taught them with the freedom and tenderness of a father; and never expected or desired that they should blindly follow his sentiments, but encouraged them to judge for themselves. He checked any appearance of bigotry and uncharitableness, and endeavoured to cure them by showing what might be said in defence of those principles they disliked. In the year 1736, the university of Aberdeen conferred upon him the degree of D.D. This very excellent divine died at Lisbon, Oct. 26, 1751, whither he went for the recovery of his health: his remains were interred in the burying-ground belonging to the British factory there: a handsome monument was erected to his memory in the meeting-house at Northampton, on which is an epitaph written by Gilbert West, esq. The following is a list of the works of Dr. Doddridge: 1. The Family Expositor. 2. Letters to the Author of Christianity not founded on Argument. 3. Life of Colonel Gardner. 4. Sermons on the Education of Children. 5. Sermons to Young People. 6. The Principles of Religion, in verse, for Children. 7. Sermons on the Power and Grace of Christ, and the Evidences of his Glorious Gospel. 8. Discourses on Regeneration. 9. Rise and Progress of Religion in the Soul. 10. Sermons on Salvation by Grace; Care of the Soul; Absurdity of Persecution; Death of Children; Compassion for the Sick; Christian Warrior; Tears of Jesus over the Grave of Lazarus, &c. &c. 11. Address to the Master of a Family, on Family Religion. 12. Hymns. 13. Theological Lectures. 14. Life of Mr. Steffe. The number and variety of his works shew the intenseness of his industry, and the extent of his capacity. The zeal and purity of his faith were expressed and enforced by a polished diction. His mind was capacious, his curiosity excursive, and his diligence continual. Few men have left behind such purity of character, or such monuments of laborious piety. Respecting the value of his writings, there is but one opinion. As an expositor, uniting the plain import of the text, supported by learned and elegant criticism, and a judicious, animated improvement, he has no superior. His sermons and other works are alike directed to inform the judgment, to affect the heart, and to regulate the life. Memoirs of his life were published by the rev. Job Orton, and by Dr. Kippis.

The admiration paid to the writings of Dr. Doddridge is willingly offered by the greatest ornaments of the national church, as well as by his dissenting brethren. Our most celebrated prelates have passed upon many of his works the warmest commendations. As a specimen of these encomiums, the justice of which none can deny, we extract a passage from a Charge delivered by the bishop of Durham, in 1792. "In reading the New Testament," says this distinguished prelate, "I recommend Doddridge's Family Expositor, as an impartial interpreter, and faithful monitor. Other expositions and commentaries might be mentioned greatly to the honour of their respective authors, for their several excellencies; such as, elegance of composition, acuteness of illustration, and copiousness of erudition: but *I know of no expositor, who unites so many advantages as Doddridge*; whether you regard the solidity of his version, the fulness and perspicuity of his composition, the utility of his general and historical information, the impartiality of his doctrinal comments, or, lastly, the piety and pastoral earnestness of his moral and religious applications. He has made, as he professes to have done, ample use of the commentators that preceded him; and in the explanation of grammatical difficulties, he has profited much more from the philological writers on the Greek Testament than could almost have been expected in so multifarious an undertaking as the Family Expositor; indeed, for all the most valuable purposes of a commentary on the New Testament, the Family Expositor cannot fall too early into the hands of those intended for holy orders."

DODECAGON, a regular polygon of 12 equal sides and angles.

If the side of a dodecagon be 1, its area will be equal to 3 times the tan. of $75^\circ = 3 \times \overline{2+\sqrt{3}} =$ 11·1961524 nearly, and, the areas of plane figures being as the squares of their sides, therefore 11·1961524 multiplied by the square of the side of any dodecagon, will give its area. See Hutton's Mensuration, p. 114, 2d. ed.

To inscribe a dodecagon in a given circle.—Carry the radius 6 times round the circumference, which will divide it into 6 equal parts, or will make a hexagon: then bisect each of those parts, which will divide the whole into 12 parts, for the dodecagon.

DODECAHEDRON, one of the Platonic bodies, or five regular solids, being contained under a surface composed of twelve equal and regular pentagons.

To form a dodecahedron. See REGULAR BODY.

If the side, or linear edge, of a dodecahedron be s, its surface will be

$$15s^2\sqrt{1+\tfrac{2}{5}\sqrt{5}}=20{\cdot}6457788s^2$$

and its solidity

$$5s^3\sqrt{\frac{47+21\sqrt{5}}{40}}=7{\cdot}66311896s^3$$

If the radius of the sphere that circumscribes a dodecahedron be r, then is its side or linear edge $=\frac{\sqrt{15}-\sqrt{3}}{3}r$,

its superficies $=10r^2\sqrt{2-\frac{2}{5}\sqrt{5}}$,

and its solidity $=\frac{20r^3}{3}\sqrt{\frac{3+\sqrt{5}}{30}}$. (*Hutton*).

DODECANDRIA. In botany. (δωδεκα, twelve, and ανηρ, a husband). Twelve-stamened. The name of the eleventh class in Linnéus's Artificial System; comprehending all those plants which have hermaphrodite flowers with from twelve to nineteen stamens inclusive.

DODECAS, in botany, a genus of the class dodecandria, order monogynia. Calyx five-cleft, superior, bearing the corol; petals five; capsule one-celled, four-valved, many seeded, crowned with the calyx. One species only; a Surinam shrub.

DODECATEMORY. (from δωδεκα, twelve, and μερος, part). The twelfth part of a circle. Astronomers sometimes use this word for a sign of the zodiac: astrologers for one of their 12 houses.

DODECATHEON, in botany, a genus of the class pentandria, order monogynia. Corol wheel-shaped, reflected; stamens seated on the tube; capsule one-celled, oblong. One species only; an elegant plant, indigenous to Virginia.

To **DODGE.** *v. n.* (corrupted from *dog*.) 1. To use craft; to deal with tergiversation; to play mean tricks; to use low shifts (*Hall*). 2. To shift place as another approaches (*Milton*). 3. To play fast and loose; to raise expectations and disappoint them (*Swift*).

DO'DKIN. *s.* (*duytken*, Dutch.) A doitkin, or little doit; a low coin (*Lily*).

DO'DMAN. *s.* The name of a fish (*Bacon*).

DODO, in ornithology. See Didus.

DODONÆA, in botany, a genus of the class octandria, order monogynia. Calyx four-leaved; corolless; capsule three-celled, three-winged; seeds in pairs. Three species; India, New Holland, and the Cape.

DODONÆUS, in antiquity, an epithet sometimes applied to Jupiter.

DODONA, a town of Thesprotia, in Epirus, or, according to others, in Thessaly. There was in its neighbourhood a celebrated oracle of Jupiter. The town and temple of the god were first built by Deucalion, after the universal deluge. It was supposed to be the most ancient oracle of all Greece; and, according to the traditions of the Egyptians mentioned by Herodotus, it was founded by a dove. The extensive grove which surrounded Jupiter's temple was endowed with the gift of prophecy; and oracles were frequently delivered by the sacred oaks and the doves which inhabited the place.

DODONIDES, the priestesses who gave oracles in the temple of Jupiter at Dodona.

DODRA, in Roman antiquity, a drink prepared from nine different ingredients; which are enumerated by the epigrammatist in the following line:

> "Jus, aqua, mel, vinum, panis, piper, herba, oleum, sal."

See Auson, Epigram 86.

DODRANS, in antiquity, three-fourths of the As.

DODRANT. (*dodrantalis mensura*). In botany, the space between the end of the thumb and of the little finger, both extended. About nine Paris inches. This measure may be called in English the long span, and spithama the short span. See Measures.

DODSLEY (Robert), an eminent bookseller, and ingenious writer, born at Mansfield in Nottinghamshire, in the year 1703. He was not indebted to education for his literary fame, being originally a livery servant; but his natural genius, and early passion for reading, soon elevated him to a superior station. He wrote an elegant little satirical farce called the Toy-shop, which was acted with applause in 1735, and which recommended him to the patronage of Mr. Pope. The following year he produced the King and Miller of Mansfield. The profits of these two farces enabled him to commence bookseller, and his own merit procured him eminence in that profession. He wrote some other dramatic pieces, and published a collection of his works in one vol. 8vo., under the modest title of Trifles; which was followed by Public Virtue, a poem in 4to. Besides what he wrote himself, the public were obliged to him for exerting his judgment in the way of his business; he having collected several volumes of well chosen Miscellaneous Poems and Fugitive Pieces, whose brevity would else have endangered their being totally lost to posterity. He died in 1764.

DODWELL (Henry), a learned writer, born at Dublin in 1641. He received his education in Trinity college, where he was chosen scholar and fellow, but he quitted the college in 1666, on account of the statute which binds the fellows to enter into orders. The same year he went to Oxford for the benefit of the public library. In 1688 he was elected Camden's professor of history in that university, and presented with his degree of M.A. but on the revolution he was deprived of his place for not taking the oaths. He died in Berkshire, in 1711. He wrote a great number of books which cannot here be enumerated. We shall therefore only mention the most eminent: 1. De Veteribus Græcorum Romanorumque cyclis, obiterque de Cyclo Judæorum ætate Christi, Dissertationes decem, cum Tabuliis necessariis, 1701, 4to. 2. An epistolary discourse proving from the scriptures and the first fathers, that the soul is a principle naturally mortal; but immortalized actually by the pleasure of God, to punishment or reward, by its union with the divine baptismal spirit. Wherein is proved that none have the power of giving this divine immortalizing spirit, since the apostles, but only the bishops, 1706, 8vo. This book occasioned a sharp controversy, and several able writers, as Dr. Clarke, Mr. Norris, and others, wrote expressly against it; but Mr. Dodwell attempted a sort of vindication of his notion in three treatises. 3. Julii Vitalis Epitaphium, cum Notis Henrici Dodwelli, et Commentario G. Musgrave, 1711, 8vo. &c.

DOE. In natural history. (See Cervus.) The female of the fallow deer, bred in parks: the male of which is called a buck, and the young (of which she produces but one annually) a fawn. Doe venison is not equal in estimation with buck venison, either in fat or flavour; nor is it in season till the latter has declined: this happens at the beginning of autumn, when the copulating or rutting time approaches. Fawns are killed for the table at three months old, consequently are fit for eating towards the latter end of August, and the beginning of September.

Doe. *s.* (from *to do.*) A seat; what one has to do; what one can perform (*Hudibras*).

DO'ER. s. (from *to do.*) 1. One that does any thing good or bad (*South*). 2. Actor; agent (*Hooker*). 3. Performer (*Sidney*). 4. An active, or busy, or valiant person (*Knolles*). 5. One that habitually performs or practises (*Hooker*).

DOES. The third person from *do*, for *doth*.

To **DOFF.** *v. a.* (from *do off.*) 1. To put off dress (*Milton. Dryden*). 2. To strip; to divest of any thing (*Crashaw*). 3. To put away; to get rid of (*Shakspeare*). 4. To shift off; to delay (*Shakspeare*).

DOFRINE MOUNTAINS, or **Dofre Field,** the highest mountains of Norway: they divide that kingdom from Sweden.

DOG. *s.* (*dogghe*, Dutch.) 1. A domestic animal remarkably various in its species. (See Canis.) 2. A reproachful name for a man (*Shakspeare*). 3. *To give or send to the* Dogs; to throw away. *To go to the* Dogs; to be ruined, destroyed, or devoured. 4. It is used as the term for the male of several species; as, the *dog* fox, the *dog* otter.

To **Dog.** *v. a.* To hunt, as a dog, insidiously and indefatigably (*Herbert*).

Dog, in astronomy. See Canis major and minor, and Sirius.

Dog-days. See Canicular days.

Dog-fish, in ichthyology. See Squalus.

Dog-tick, in entomology. See Acarus.

Dog's-bane (Syrian). This plant, asclepias syriaca of Linnéus, is particularly poisonous to dogs, and also to the human species. Boiling appears to destroy the poison in the young shoots, which are then said to be esculent, and flavoured like asparagus. See Asclepias and Apocynum.

There are various other plants which appear to derive the same benefit from boiling. Thus the root of Indian cassava or jatropa manihot of Linnéus, which, in its natural state, is a most fatal poison, may be safely eaten after having been submitted to the same culinary operation.

Dog-fly. See Cynomyia.

Dog-berry, in botany. See Cornus.

Dog's-stone. See Orchis.

Dog's-tooth, (Violet). See Erythronium.

Dog's-tooth, (Spar). See Spatum.

Dog-rose. See Rosa.

Dog-wood. See Cornus.

Dog-wood (Jamaica). See Erythrina.

DOGADO, a province of the late Venetian states, in which is the capital . It is bounded on the E. by the Gulf of Venice, on the S. by Palçsino, on the W. by Paduano, and on the N. by Trevisano. It comprehends many small islands near it, called the Lagunes of Venice.

DO'GCHEAP. *a.* (*dog* and *cheap.*) Cheap as dogs meat (*Dryden*).

DOGE, the chief magistrate of the republics of Venice and Genoa. The word properly signifies duke, being formed from the Latin *dux*, as *dogate*, and *dogado*, from *ducatus*, duchy. The dogate, or office and dignity of doge, is elective: at Venice, the doge is elected for life; at Genoa, only for two years: he is addressed under the title of Serenity, which among the Venetians is superior to that of highness.

The doge of Venice, however, is no more than the shadow of a prince; all the authority being reserved to the republic. Anciently indeed the doges were sovereigns; but at present it is far otherwise. The doge indeed gives audience to ambassadors; but does not give them any answer for himself in matters of any importance; only he is allowed to answer according to his own pleasure, to the compliments they make to the signiory; such answers being of no consequence. The doge, as being first magistrate, presides in all the councils; and the credentials which the senate furnishes its ministers in foreign courts are written in his name. He does not sign them, however; but a secretary of state signs them, and seals them with the arms of the republic. The ambassadors direct their dispatches to the doge; and yet he must not open them but in presence of the counsellors.

DO'GGED. *a.* (from *dog.*) Sullen: sour; morose; ill-humoured; gloomy (*Hudibras*).

DO'GGEDLY. *ad.* Sullenly; gloomily; sourly.

DO'GGEDNESS. *s.* (from *dogged.*) Gloom of mind; sullenness; moroseness.

DOGGER, a small ship, built after the Dutch fashion, with a narrow stern, and two masts; viz. a main-mast, and a mizen-mast, principally used in fishing on the Dogger bank.

Dogger bank, a very extensive sand bank in the German ocean, between the coast of England and Germany.

DO'GGEREL. *a.* (from *dog.*) Vile; despicable; mean: used of verses (*Dryden*).

Do'ggerel. *s.* Mean, despicable, worthless verses (*Swift*).

DO'GGISH. *a.* (from *dog.*) Currish; brutal.

DO'GHEARTED. *a.* (*dog* and *heart.*) Cruel; pitiless; malicious (*Shakspeare*).

DO'GHOLE. *s.* (*dog* and *hole.*) A vile hole; a mean habitation (*Pope*).

DO'GKENNEL. *s.* (*dog* and *kennel.*) A little hut or house for dogs (*Tatler*).

DO'GLOUSE. *s.* (*dog* and *louse.*) An insect that harbours on dogs.

DOGMA, Δογμα, a maxim, tenet, settled proposition, or principle; particularly in matters of religion, or philosophy.

DOGMATICAL, something relating to a doctrine, or opinion.

In common use, a dogmatical philosopher is such an one as asserts every thing positively; in opposition to a sceptic, who doubts of every thing.

A dogmatical physician is he, who, on the principles of the school philosophy, rejects all medicinal virtues not reducible to manifest qualities.

DOGMATICI, Dogmatists, a sect of ancient physicians, called also logici, logicians, from their using the rules of logic and reason, in subjects of their profession.

They laid down definitions, and divisions, reducing diseases to certain genera, those genera to species, and furnishing remedies for them all; supposing principles, drawing consequences, and applying these principles and consequences to the particular diseases under consideration. In which sense the dogmatists stand contradistinguished to empirics, and methodists.

DOGMATICALLY. *ad.* (from *dogmatical.*) Magisterially; positively (*South*).

DOGMA'TICALNESS *s.* (from *dogmatical.*) Magisterialness; mock authority.

DO'GMATIST. *s.* (*dogmatiste*, French.) A magisterial teacher; a positive assertor; a bold advancer of principles (*Watts*).

To **DO'GMATIZE.** *v. n.* (from *dogma.*) To assert positively; to advance without distrust; to teach magisterially (*Blackmore*).

DOGMATI'ZER. *s.* (from *dogmatize.*) An assertor; a magisterial teacher (*Hammond*).

DO'GSLEEP. *s.* (*dog* and *sleep.*) Pretended sleep (*Addison*).

DO'GSMEAT. *s.* (*dog* and *meat.*) Refuse; vile stuff (*Dryden*).

DO'GSTAR. *s.* (*dog* and *star.*) The star which gives name to the dogdays. See Sirius.

DO'GTROT. *s.* A gentle trot like that of a dog (*Hudibras*).

DOGWEA'RY. *a.* Tired as a dog (*Shak.*).

DO'INGS. *s.* (from *to do.*) 1. Things done; events; transactions (*Shakspeare*). 2. Feats; actions (*Milton*). 3. Behaviour; conduct (*Sidney*). 4. Conduct; dispensation (*Hooker*). 5. Stir; bustle; tumult (*Hooker*). 6. Festivity; merriment; as, *gay* doings.

DOIT. *s.* (*duyt*, Dutch.) A small piece of money (*Shakspeare*).

DOLABRIFORM. (*dolabra*, an axe, *a dolando.*) In botany, an axe or hatchet-shaped leaf. Battledore-shaped. Compressed, roundish, obtuse, gibbous on the outside with a sharp edge, roundish below. As in mesembryanthemum dolabriforme.

DOLABRUM, a knife used in the Roman sacrifices.

DOLCE, a musical term, from the Italian, denoting that the passage over which it is placed is to be sung or played in a soft and sweet style.

DOLCIGNO, an episcopal town of Albania, in European Turkey. Lat. 42. 12 N. Lon. 19. 20 E.

DOLE. *s.* (from *deal*, dælan, Saxon.) 1. The act of distribution or dealing (*Cleavel.*). 2. Any thing dealt out or distributed (*Hudib.*). 3. Provisions or money distributed in charity (*Dryden*). 4. Blows dealt out (*Milton*). 5. (from *dolor*, Lat.) Grief; sorrow (*Shakspeare*).

To **Dole.** *v. a.* (from the noun.) To deal; to distribute.

Dole, in the Saxon and British tongue, signified a part or portion, most commonly of a meadow, where several had shares. It also still signifies a distribution or dealing of alms, or a liberal gift made by a great man to the people.

Dole, in the laws of Scotland, is used for a malevolent intention. It is essential to the criminality of an action.

DO'LEFUL. *a.* (*dole* and *full.*) 1. Sorrowful; expressing grief (*South*). 2. Melancholy; feeling grief (*Sidney*). 3. Dismal; impressing sorrow (*Hooker*).

DO'LEFULLY. *ad.* In a doleful manner; sorrowfully; dismally; querulously.

DO'LEFULNESS. *s.* 1. Sorrow; melancholy. 2. Querulousness. 3. Dismalness.

DO'LESOME. *a.* (from *dole.*) Melancholy; gloomy; dismal; sorrowful (*Pope*).

DO'LESOMELY. *ad.* In a dolesome manner.

DO'LESOMENESS. Gloom; melancholy.

DOLGELLIEW, or Dolgelly, a town of Merionethshire, in North Wales, having a market on Tuesdays. It is seated at the foot of the great rock Cader Idris. Lat 52. 42 N. Lon. 9. 48 W. This town contains 658 houses, and 2950 inhabitants.

DOLICHOS, in antiquity, according to Suidas, signifies a race or course of 12 stadia, or of 24.

Dolichos, Cowhage. In botany, a genus of the class diadelphia, order decandria; banner with two parallel, oblong callosities at the base, compressing the wings underneath. Fifty-three species; natives of the East or West Indies, or the Cape, which may be thus subarranged:

A. Twining.
B. Erect.
C. Doubtful.

The following are the chief:

1. D. lablab. Twining; legumes ovate, scymitar-shaped; seeds ovate, with a curved eye towards one end. A beautiful climbing shrub, and largely cultivated in the garden of Egypt for the purpose of making bowers and arbours, on account of the excellent shade afforded by its leaves. See Botany, Pl. LXXXV.

2. D. soja. Soy cowage. Called by the Japonese daidsu or the pod-flower by way of eminence on account of its beauty. Stem erect, flexuous, racemes axillary, erect; legumes pendulous, bristly, about two-seeded. This plant is also highly valued by the Japonese for its culinary purposes: their cooks obtaining from it a kind of butter which they term miso, and a pickle called sooja, whence the present specific name; this is obtained from the seeds, and is known among ourselves under the name of soy.

3. D. pruriens. Itching cowhage, or common cowitch. Twining; legumes racemed; the valves slightly carinate and hairy; peduncles three together. The hairs upon this and several other species, as d. ureus, produce a pungent itching smart, if handled or blown upon the skin by a slight breeze. These hairs grow upon the leaves which are covered with them; the legumes are compressed, influted at the base and reflected at the tip like an Italian *f*. The flowers of this plant are very beautiful, and would more frequently be cultivated were it not for the troublesome property of its leaf-hairs. It flowers in the cooller months of the year; generally from September to March. The spiculæ or leaf-hairs of the plant have been long regarded in the West Indies as an excellent vermifuge, particularly in the case of ascarides; and they are said to have been tried of late years with success in our own country. The spiculæ of a single pod mixed into an electuary with molasses is a dose for an adult.

DOLL. s. A little girl's puppet or baby-toy.

DOLLAR, or DALLER, a silver coin current in several parts of Spain, Germany, and Holland. There are various kinds and divisions of dollars, as the Rix-dollar, Semi-dollar, Quarter-dollar, &c. See MONEY TABLES.

DOLLOND (John), was born in Spitalfields in June 1706: his parents were French protestants, who quitted Normandy at the revocation of the edict of Nantz in 1685.

The first years of Mr. Dollond's life were employed at the loom; but, being of a very studious and philosophic turn of mind, his leisure hours were engaged in mathematical pursuits; and though by the death of his father, which happened in his infancy, his education gave way to the necessities of his family, yet at the age of fifteen, before he had an opportunity of seeing works of science or elementary treatises, he amused himself by constructing sun-dials, drawing geometrical schemes, and solving problems. Under the pressure of a close application to business for the support of his family, he found time, by abridging the hours of his rest, to extend his mathematical knowledge, and made a considerable proficiency in optics and astronomy, to which he now principally devoted his attention, having in the earlier stages of his life prepared himself for the higher parts of those subjects by a correct knowledge of algebra and geometry. He also acquired a very respectable knowledge of the Latin and Greek languages.

He designed his eldest son, Peter Dollond, for the same business with himself; and for several years they carried on their manufacture together in Spitalfields; but the employment neither suited the expectations nor dispositions of the son, who, having received much information upon mathematical and philosophical subjects from the instruction of his father, and observing the great value which was set upon his father's knowledge in the theory of optics by professional men, determined to apply that knowledge to the benefit of himself and his family; and accordingly, under the directions of his father, commenced optician. Success attended every effort; and in the year 1752 John Dollond, embracing the opportunity of pursuing a profession congenial with his mind, joined his son, and in consequence of his theoretical knowledge, soon became a proficient in the practical parts of optics.

His first attention was directed to improve the combination of the eye-glasses of refracting telescopes; and having succeeded in his system of four eye-glasses, he proceeded one step further, and produced telescopes furnished with five eye-glasses, which considerably surpassed the former; and of which he gave a particular account in a paper presented to the Royal Society, and which was read on the 1st of March 1753, and printed in the Phil. Trans. vol. lxviii. page 103.

Soon after this he made a very useful improvement in Mr. Savery's micrometer: for instead of employing two entire object-glasses, as Mr. Savery and M. Bouguer had done, he used only one glass cut into two equal parts, one of them sliding or moving laterally by the other. This was considered to be a great improvement, as the micrometer could now be applied to the reflecting telescope with much advantage, and which Mr. James Short immediately did. An account of the same was given to the Royal Society, in a paper which was afterwards printed in the Phil. Trans. vol. xlviii. page 178.

Mr. Dollond's celebrity in optics became now universal; and the friendship and protection of the most eminent men of science flattered and encouraged his pursuits. Surrounded by these enlightened men, in a state of mind prepared for the severest investigation of philosophic truths, and in circumstances favourable to liberal inquiry, Mr. Dollond engaged in the discussion of a subject, which at that time not only interested this country, but all Europe. Sir Isaac Newton had declared, in his Treatise on Optics, page 112, "That all refracting substances diverged the prismatic colours in a constant proportion to their mean refraction;" and drew this conclusion, "that refraction could not be produced without colour;" and, consequently, "that no improvement could be expected in the refracting telescope." No one doubted the accuracy with which sir Isaac Newton had made the experiment; yet some men, particularly M. Euler and others, were of opinion that the conclusion which Newton had drawn from it went too far, and maintained that in very small angles refraction might be obtained without colour. Mr. Dollond was not of that opinion, but defended Newton's doctrine with much learning and ingenuity, as may be seen by a reference to the letters which passed between Euler and Dollond upon that occasion, and which were published in the Phil. Trans. vol. xlviii. page 287. and contended that, "If the result of the experiment had been as described by sir Isaac Newton, there could not be refraction without colour."

A mind constituted like Mr. Dollond's could not remain satisfied with arguing in this manner from an experiment made by another, but determined to try it himself: and, accordingly, in the year 1757, began the examination; and, to use his own words, with "a resolute perseverance," continued during that year, and a great part of the next, to bestow his whole mind on the subject, until in the month of June 1753 he found, after a complete course of experiments, the result to be very different from that which he expected, and from that which sir Isaac Newton had related. He discovered "the difference in the dispersion of the colours of light, when the mean rays are equally refracted by different mediums." The discovery was complete, and he immediately drew from it this practical conclusion, "That the object-glasses of refracting telescopes were capable of being made without being affected by the different refrangibility of the rays of light." His account of this experiment, and of others connected with it, was given to the Royal Society, and printed in their Transactions, vol. l. page 743, and he was presented in the same year, by that learned body, with sir Godfrey Copley's medal, as a reward of his merit, and a memorial of the discovery, though not at that time a member of the society.

This discovery no way affected the points in dispute between Euler and Dollond, respecting the doctrine advanced by sir Isaac Newton. A new principle was in a manner found out, which had no part in their former reasonings, and it was reserved for the accuracy of Dollond to have the honour of making a discovery which had eluded the observation of Newton. This new principle being now established, he was soon able to construct object-glasses, in which the different refrangibility of the rays of light was corrected, and the name of achromatic given to them by the late Dr. Bevis, on account of their being free from the prismatic colours.

As usually happens on such occasions, no sooner was the achromatic telescope made public, than the rivalship of foreigners, and the jealousy of philosophers at home, led them to doubt of its reality; and Euler himself, in his paper read before the Academy of Sciences at Berlin, in the year 1764, says, "I am not ashamed frankly to avow, that the first accounts, which were published of it, appeared so suspicious, and even so contrary to the best established principles, that I could not prevail upon myself to give credit to them;" and he adds, "I should never have submitted to the proofs which Mr. Dollond produced to support this strange phenomenon, if M. Clairaut, who must at first have been equally surprised at it, had not most positively assured me, that Dollond's experiments were but too well founded." And when the fact could no longer be disputed, they endeavoured to find a prior inventor, to whom it might be ascribed, and several conjecturers were honoured with the title of discoverers.

In the beginning of the year 1761, Mr. Dollond was elected fellow of the Royal Society, and appointed optician to his majesty, but did not live to enjoy those honours long; for on the 30th of November, in the same year, as he was reading a new publication by M. Clairaut, on the theory of the moon, and on which he had been intently engaged for several hours, he was seized with apoplexy, which rendered him immediately speechless, and occasioned his death in a few hours afterwards. Besides Mr. Peter Dollond, whom we have had occasion to mention in the course of this memoir, his family, at his death, consisted of three daughters and a son, who, possessing the name of his father, and, we may add, a portion of the family abilities, carries on the optical business in partnership with his elder brother. (*Phil. Mag.*)

DOLOMITE. See Marmor.

DOLORI'FIC. *a.* (*dolorificus*, Lat.) That causes grief or pain (*Ray*).

DO'LOROUS. *a.* (from *dolor*, Lat.) 1. Sorrowful; doleful; dismal (*Milton*). 2. Painful (*More*).

DO'LOUR. *s.* (*dolor*, Latin.) 1. Grief; sorrow (*Shakspeare*). 2. Lamentation; complaint (*Sidney*). 3. Pain; pang (*Bacon*).

DOLOUREUX TIC. Dolor faciei. A painful intermittent disease which attacks the face. It consists in a chronic fixed pain, which has paroxysms of acute pain, during which last the patient feels violent laucinating twitches, like the ticking of a clock. The seat of this affection is in the branches of the facial nerve and the suborbitar branches of the fifth pair.

DOLPHIN, in zoology. See Delphinus.

DOLT. *s.* (*dol*, Teutonick.) A heavy stupid fellow; a blockhead (*Shakspeare*).

DO'LTISH. *a.* (from *dolt.*) Stupid; mean; dull; blockish (*Sidney*).

DOM, or Don, a title of honour invented and chiefly used by the Spaniards, signifying sir or lord. This title, it seems, was first given to Pelayo, in the beginning of the eighth century. In Portugal no person can assume the title of don without the permission of the king, since it is looked upon as a mark of honour and nobility. In France it was sometimes used among the religious. It is an abridgment of *domnus*, from *dominus*.

DOM and SOM, in old charters, signifies full property and jurisdiction.

DO'MABLE. *a.* (*domabilis*, Latin.) Tameable.

DOMA'IN. *s.* (*domaine*, French.) 1. Dominion; empire (*Milton*). 2. Possession; estate. See DEMESNE.

DOMBEYA, in botany, a genus of the class monodelphia, order dodecandria. Calyx double; the outer three-leaved, deciduous; petals five; stamens ten or twenty, five of them barren; style five-cleft; capsules five, united, one-celled, one or many-seeded. Twelve species; chiefly natives of the isles of Bourbon and Mauritius.

DOME, in architecture, a round, vaulted, or arched roof, sometimes hemispherical, raised over the middle of a building, as a church, hall, pavilion, vestibule, &c. by way of crowning.

The word is formed from the corrupt Latin, *doma*, a roof, or open porch. Domes are the same with what the Italians call *cuppolas*, and we *cupolas*; the Latins, *tholi*.

The erection of a dome is, manifestly, a scientific art, proceeding on the principles of equilibration; principles that require, or admit of, modifications, in consequence of the cohesion and friction of materials. At first sight, a dome appears a more difficult piece of work than a plain arch; but when we observe potters kilns and glasshouse domes and cones of vast extent, erected by ordinary bricklayers, and with materials vastly inferior in size to what can be employed in common arches of equal extent, we must conclude that the circumstance of curvature in the horizontal direction, or the abutment of a circular base, gives some assistance to the artist. Of this we have complete demonstration in the case of the cone. We know that a vaulting in the form of a pent roof could not be executed to any considerable extent, and would be extremely hazardous, even in the smallest dimensions; while a cone of the greatest magnitude can be raised with very small stones, provided only that we prevent the bottom from flying out, by a hoop, or any similar contrivance. And when we think a little of the matter, we see plainly, that if the horizontal section be perfectly round, and the joints be all directed to the axis, they all equally endeavour to slide inwards, while no reason can be offered why any individual stone should prevail. They are all wedges, and operate only as wedges. When we consider any single course, therefore, we see that it cannot fall in, even though it may be part of a curve which could not stand as a common arch; nay, we see that a dome may be constructed, having the convexity of the curve, by the revolution of which it is formed, turned towards the axis, so that the outline is concave. The force which binds the stones of a horizontal course together, by pushing them towards the axis, will be greater in flat domes than those that are more convex; it will be still greater in a cone; and greater still in a curve whose convexity is turned inwards. Nay, since the friction of two pieces of stone is not less than half of their mutual pressure, it may be proved that a dome will stand, although the tangent to the curve at the base should be horizontal, provided the horizontal thrust be double the weight of the dome, which may easily be the case, if it do not rise high. As to a cone, it may be loaded on the top with the greatest weight, without the smallest danger of forcing it down, so long as the bottom course is firmly kept from bursting outwards. The stone lanthern on the top of St. Paul's cathedral in London weighs several hundred tons, and is carried by a brick cone of eighteen inches thick, with perfect safety, as long as the bottom course is prevented from bursting outwards. The reason is evident: The pressure on the top is propagated along the cone in the direction of the slant side; and, so far from having any tendency to break it in any part, it tends rather to prevent its being broken by any irregular pressure from foreign causes.

The stability of a dome obviously depends upon very different principles from that of a common arch, and is, in general, much greater. It differs also in another important circumstance, viz. it may be open in the middle: for the uppermost course, by tending equally in every part to slide in towards the axis, presses all together in the vertical joints, and acts on the next course like the key stone of a common arch. Therefore, an arch of equilibration, which is the weakest of all, may be open in the middle, and carry at top another building, such as a lanthern, if its weight do not exceed that of the circular segment of the dome that is omitted. A greater load than this would indeed break the dome, by causing it to spring up in some of the lower courses; but this load may be increased if the curve is flatter than that of equilibration: and any load whatever, which will not crush the stones to powder, may be set on a truncate cone, or on a dome formed by a curve that is convex toward the axis; provided always, that the foundation be effectually prevented from flying out, either by a hoop of iron, which need seldom exceed an inch in thickness, or by a sufficient mass of solid pier on which it is set. It is possible to construct domes, particularly hemispherical ones, without centering, provided the stones be cut in the proper converging wedge-like form, so that they must be inserted from the outside, and cannot fall through; but we do not recommend the plan to general adoption.

Persuaded, that what has been said on the subject convinces the reader that a vaulting perfectly equilibrated throughout is by no means the best form, provided that the base is secured from separating, we think it unnecessary to give the investigation of that form, which has a considerable intricacy; and shall content ourselves with merely giving its dimensions. The thickness is supposed uniform. The numbers in the first column of the table express the portion of the axis counted from the vertex, and those of the second column are the lengths of the ordinates.

AD	DB	AD	DB	AD	DB
0,4	100	610,4	1080	2990	1560
3,4	200	744	1140	3442	1600
11,4	300	904	1200	3972	1640
26,6	400	1100	1260	4432	1670
52,4	500	1336	1320	4952	1700
91,4	600	1522	1360	5336	1720
146,8	700	1738	1400	5756	1740
223,4	800	1984	1440	6214	1760
326,6	900	2270	1480	6714	1780
465,4	1000	2602	1520	7260	1800

The curve formed according to these dimensions, appears destitute of gracefulness; because its curvature changes abruptly at a little distance from the vertex, so that it has some appearance of being made up of different curves pieced together. But if the middle be occupied by a lanthern of equal, or of smaller weight, this defect will cease, and the whole will be elegant, nearly resembling the exterior dome of St. Paul's in London.

It is not a small advantage of dome-vaulting that it is lighter than any that can cover the same area. If, moreover, it be spherical, it will admit considerable varieties of figure, by combining different spheres. Thus, a dome may begin from its base as a portion of a large hemisphere, and may be broken off at any horizontal course, and then a similar or a greater portion of a smaller sphere may spring from this course as a base.

We conclude this article with observing, that the connection of the parts, arising from cement and from friction, has a great effect on dome-vaulting. In the same way as in common arches and cylindrical vaulting, it enables an overload on one place to break the dome in a distant place. But the resistance to this effect is much greater in dome-vaulting, because it operates all round the overloaded part. Hence it happens that domes are much less shattered by partial violence, such as the falling of a bomb or the like. Large holes may be broken in them without much affecting the rest; but, on the other hand, it greatly diminishes the strength which should be derived from the mutual pressure in the vertical joints. Friction prevents the sliding in of the arch stones which produces this mutual pressure in the vertical joints, except in the very highest courses, and even there it greatly diminishes it. These causes make a great change in the form which gives the greatest strength; and as their laws of action are but very imperfectly understood as yet, it is perhaps impossible, in the present state of our knowledge, to determine this form with tolerable precision. We see plainly, however, that it allows a greater deviation from the best form than the other kind of vaulting, and domes may be made to rise perpendicular to the horizon at the base, although of no great thickness; a thing which must not be attempted in a plain arch. The immense addition of strength which may be derived from hooping, largely compensates for all defects; and there is hardly any bounds to the extent to which a very thin dome-vaulting may be carried, *when it is hooped or framed in the direction* of the horizontal courses. (*Sup. Ency. Brit.*)

For more on this subject, see Emerson's Miscellanies, Gregory's Mechanics, vol. i. and the Treatise on Arches at the end of Bossut's Mechanics.

DOMENICHINO, an Italian painter, born at Bologna in 1681. He studied in the school of the Caracci, where his fellow pupils, from his slowness, called him in derision, the Ox; but one of his masters told them, that "this ox would in time make his ground so fruitful, that painting would be fed by what it produced." This prediction he completely fulfilled. He was no less skilled in architecture; and pope Gregory XV. appointed him the chief architect of the apostolical palace. He died in 1641.

DOMES-DAY or **DOOMS-DAY-BOOK.** (*Liber judiciarius vel censualis Angliæ.*) The judicial book, or book of the survey of England; a most ancient record made in the time of William the Conqueror; upon a survey, or inquisition, of the several counties, hundreds, tithings, &c.

Its name is formed from the Saxon *dom*, doom, judgment, sentence; and day, which has the same force; so that dome-day is no more than a reduplicative, importing judgment judgment

But some condemn this etymology as whimsical; and contend that if it were just, the Latin for domes-day would be *dies judicii*; whereas, as appears above, it is stiled *Liber judiciarius, vel censualis Angliæ*. Bullet, in his Celtic Dictionary, hath the word *dom*, which he reads *seur, seigneur*, and hence the Spanish word *don*, as also the words *deya*, and *deia*, which he renders proclamation, advertisement. Dooms-day therefore signifies the lord's or king's proclamation, or advertisement, to the tenants who hold under him; and agrees well with great part of the contents of this famous survey. Observations on the Statutes, p. 190. note (*m*).

Domes-day-book consists of two volumes, a greater and a less. The first is a large folio, written on 382 double pages of vellum, in a small but plain character; each page having a double column. Some of the capital letters and principal passages are touched with red ink; and some have strokes of red ink run across them, as if scratched out. This volume contains the description of 31 counties. The other volume is in quarto, written upon 450 double pages of vellum, but in a single column, and in a large but very fair character. It contains the counties of Essex, Norfolk, Suffolk, part of the county of Rutland included in that of Northampton, and part of Lancashire in the counties of York and Chester.

This work, according to the red book in the exchequer, was begun by order of William the Conqueror, with the advice of his parliament, in the year of our Lord 1080, and completed in the year 1086. The reason given for taking this survey, as assigned by several ancient records and historians, was, that every man should be satisfied with his own right, and not usurp with impunity what belonged to another. But, besides this, it is said by others, that now all those who possessed landed estates became vassals to the king, and paid him so much money by way of fee or homage in proportion to the lands they held. This appears very probable, as there was at that time extant a general survey of the whole kingdom, made by order of king Alfred.

William's survey, at the time it was made, gave great offence to the people; and occasioned a jealousy that it was intended for some new imposition. But notwithstanding all the precaution taken by the conqueror to have this survey faithfully and impartially executed, it appears from indisputable authority, that a false return was given in by some of the commissioners; and that, as it is said, out of a pious motive. This was particularly the case with the abbey of Croyland in Lincolnshire, the possessions of which were greatly under-rated, both with regard to quantity and value. Perhaps more of these pious frauds were discovered; as it is said Ralph Flambard, minister to William Rufus, proposed the making a fresh and more vigorous inquisition; but this was never executed.

Notwithstanding this proof of its falsehood in some instances, which must throw a suspicion on all others, the authority of domesday-book was never permitted to be called in question; and always, when it has been necessary to distinguish whether lands were held in ancient demesne, or in any other manner, recourse was had to domesday-book, and to that only, to determine the doubt. From this definitive authority, from which, as from the sentence pronounced at domesday, or the day of judgment, there could be no appeal, the name of the book is said to have been derived. But Stowe assigns another reason for this appellation; namely, that domesday-book is a corruption of *domus Dei book*; a title given it because heretofore deposited in the king's treasury, in a place of the church of Westminster or Winchester, called *domus Dei*. From the great care formerly taken for the preservation of this survey, we may learn the degree of estimation in which it was held. The dialogue de Scaccariis says, "*Liber ille* (domesday) *sigilli regis comes est individuus in thesauro*." Until lately it has been kept under three different locks and keys; one in the custody of the treasurer, and the others in that of the two chamberlains of the exchequer. It is now deposited in the chapter-house at Westminster, where it may be consulted on paying to the proper officers a fee of 6*s.* 8*d.* for a search, and four-pence per line for a transcript.

Besides the two volumes above-mentioned, there is also a third made by order of the same king; and which differs from the others in form more than in matter. There is also a fourth called domesday, which is kept in the exchequer; which, though a very large volume, is only an abridgment of the others. In the remembrancer's office in the exchequer, is kept a fifth book, likewise called domesday, which is the same with the fourth book already mentioned. King Alfred had a roll which he called domesday; and the domesday-book made by William the Conqueror referred to the time of Edward the Confessor, as that of king Alfred did to the time of Ethelred. The fourth book of domesday having many pictures and gilt letters in the beginning relating to the time of king Edward the Confessor, some were led into a false opinion that domesday-book was composed in the reign of king Edward.

DOME'STICAL. Dome'stic. *a.* (*domesticus*, Latin.) 1. Belonging to the house; not relating to things public (*Hooker*). 2. Private; done at home; not open (*Hooker*). 3. Inhabiting the house; not wild (*Addison*). 4. Not foreign; intestine (*Shakspeare*).

To DOME'STICATE. *v. a.* (from *domestic.*) To make domestic; to withdraw from the public (*Clarissa*).

DOME'STIC. *s.* One kept in the same house (*South*).

DOMESTICUS, in antiquity, an officer in the court of the emperors of Constantinople. *Domestici* were such as assisted the prince in the administration of affairs, whether those of his family, of justice, or of the church. They had appropriate names to distinguish their peculiar offices; as *domesticus murorum*, he who superintended the fortifications.

To DO'MIFY. *v. a.* (*domifico*, Lat.) To tame.

DOMIFYING, Domification, in astrology, the dividing or distributing the heavens into twelve houses; in order to erect a theme, or horoscope.

DO'MINANT. *a.* (*dominans*, Lat.) Predominant; presiding; ascendant.

Dominant. (from the Latin word *dominari*, to rule or govern.) Among musicians, is used either as an adjective or substantive; but these different acceptations are far from being indiscriminate. In both senses it is explained by Rousseau as follows: the dominant or sensible chord is that which is practised upon the dominant of the tone, and which introduces a perfect cadence. Every perfect major chord becomes a dominant chord, as soon as the seventh minor is added to it.—Dominant (subst.) Of the three notes essential to the tone, it is that which is a fifth from the tonic. The tonic and the dominant fix the tone; in it they are each of them the fundamental sound of a particular chord; whereas the mediant, which constitutes the mode, has no chord peculiar to itself, and only makes a part of the chord of the tonic. Mr. Rameau gives the name of dominant in general to every note which carries a chord of the seventh, and distinguishes that which carries the sensible chord by the name of a tonic dominant; but, on account of the length of the word, this addition to the name has not been adopted by musicians: they continue simply to call that note a dominant which is a fifth from the tonic; and they do not call the other notes which carry a chord of the seventh dominants, but fundamentals; which is sufficient to render their meaning plain, and prevents confusion. A dominant, in that species of church-music which is called plain-chant, is that note which is most frequently repeated or beaten, in whatever degree it may be from the tonic. In this species of music there are dominants and tonics, but no mediant.

To DO'MINATE. *v. a.* (*dominatus*, Lat.) To predominate; to prevail over the rest (*Dr.*).

DOMINA'TION. *s.* (*dominatio,* Latin) 1. Power; dominion (*Shakspeare*). 2. Tyranny; insolent authority (*Arbuthnot*). 3. One highly exalted in power: used of angelic beings (*Milton*).

DO'MINATIVE. *a.* (from *dominate*.) Imperious; insolent.

DOMINA'TOR. *s.* (Latin.) The presiding power, or influence (*Camden*)

To DOMINE'ER *v. n.* (*dominor*, Latin.) To rule with insolence; to swell; to bluster; to act without control (*Prior*).

DOMINGO (St.) or HISPANIOLA, one of the richest islands of the West Indies, is about 400 miles in length, and 75 in breadth, and lies between Jamaica and Porto Rico. It was discovered by Columbus in 1492, and is surrounded by craggy rocks and dangerous shoals. The heat would be almost insupportable, were it not mitigated by the easterly winds, and frequent rains. It has a great many rivers, and mines of gold, talc, and crystal. Before the treaty of peace between France and Spain, in 1795, the W. part of this island only belonged to the French, the E. to the Spaniards; but by that treaty the Spanish part was ceded to France. The W. part of this island has been lately subject to the most dreadful calamities, not only from an insurrection of the negroes, but from a civil war between the democrats and the royalists. The chief town is also named St. Domingo; it is built in the Spanish manner, with a great square in the middle of it; it is seated on the S.E. shore of the island. Lat. 18. 20 N. Lon. 70. 10 W.

DOMINICA, a small island of the West Indies, 30 miles N. of Martinico. It was discovered by Columbus on a Sunday, which gave rise to its name. Lat. 15. 18 N. Lon. 61. 27 W.

DOMINICA, one of the Marquesas, in the South sea. Lat. 9. 41 S. Lon. 139. 2 W.

DOMINICAL LETTER, in chronology, properly called Sunday letter, one of the seven letters of the alphabet ABCDEFG, used in almanacks, ephemerises, &c. to denote the Sundays throughout the year.

In our almanacks, the first seven letters of the alphabet are commonly placed to shew on what days of the week the days of the months fall throughout the year. And because one of those seven letters must necessarily stand against Sunday, it is printed in a capital form, and called the dominical letter; the other six being inserted in different characters, to denote the other six days of the week. Now, since a common Julian year contains 365 days, if this number be divided by 7 (the number of days in a week) there will remain one day. If there had been no remainder, it is plain the year would constantly begin on the same day of the week: but since one remains, it is plain, that the year must begin and end on the same day of the week; and therefore the next year will begin on the day following. Hence, when January begins on Sunday, A is the dominical or Sunday letter for that year: then, because the next year begins on Monday, the Sunday will fall on the seventh day, to which is annexed the seventh letter G, which therefore will be the dominical letter for all that year: and as the third year will begin on Tuesday, the Sunday will fall on the sixth day; therefore F will be the Sunday letter for that year. Whence it is evident, that the Sunday letters will go annually in retrograde order thus, G, F, E, D, C, B, A. And, in the course of seven years, if they were all common ones, the same days of the week and dominical letters would return to the same days of the months. But because there are 366 days in a leap-year, if the number be divided by 7, there will remain two days over and above the 52 weeks of which the year consists. And, therefore, if the leap-year begins on Sunday, it will end on Monday; and as the year will begin on Tuesday, the first Sunday whereof must fall on the sixth of January, to which is annexed the letter F, and not G, as in common years. By this means, the leap-year returning every fourth year, the order of the dominical letters is interrupted; and the series cannot return to its first state till after four times seven, or 28 years; and then the same days of the months return in order to the same days of the week as before.

The dominical letter may be found universally, for any year of any century, thus:

Divide the centuries by 4; and twice what does remain
Take from 6; and then add to the number you gain
Their odd years and their 4th; which dividing by 7,
What is left take from 7, the letter is given.

Thus, for the year 1878 the letter is F.

For the centuries 18 divided by 4, leave 2; the double of which taken from 6 leaves 2 again; to which add the odd years 78, and their 4th part 19, the sum 99 divided by 7 leaves 1; which taken from 7, leaves 6, answering to F the 6th letter in the alphabet.

DOMINICANS, an order of religious, called in some places Jacobins; and in others, Predicants, or Preaching Friars. The Dominicans take their name from their founder Dominic de Guzman, a Spanish gentleman, born in 1170, at Calaroga, in Old Castile. He was first canon and archdeacon of Osma; and afterwards preached with great zeal and vehemence against the Albigenses in Languedoc, where he laid the foundation of his order. The first convent was founded at Tholouse by the bishop and Simon de Montfort. Two years afterwards they had another at Paris; and some time after, a third in the rue St. Jaques, whence the denomination of Jacobins. Just before his death, Dominic sent Gilbert de Fresney, with twelve of the brethren, into England, where they founded their first monastery at Oxford, in the year 1221, and soon after another at London. In the year 1276, the mayor and aldermen of the city of London gave them two whole streets by the river Thames, where they erected a very commodious convent, whence that spot is still called Black Friars, a name by which the Dominicans were then distinguished. St. Dominic, at first, only took the habit of the regular canons; that is, a black cassock and rochet: but this he quitted in 1219, for that which they now wear, which, it is pretended, was shown by the Blessed Virgin herself to the beatified Renaud d'Orleans. The dogmata of the Dominicans are usually opposite to those of the Franciscans.

There are also nuns or sisters of this order, called in some places Preaching Sisters. These are even more ancient than the friars; St. Dominic having founded a society of religious maids at Prouilles, some years before the institution of his order of men; viz. in 1206. There is also a third order of Dominicans, both for men and women.

DOMI'NION. s. (*dominium*, Latin.) 1. Sovereign authority; unlimited power (*Milton*). 2. Power; right of possession or use, without being accountable (*Locke*). 3. Territory; region; district (*Davies*). 4. Predominance; ascendant (*Dryden*). 5. An order of angels (*Colossians*).

DOMINO. (*dominus*, Lat. a chief, or master.) A hood worn by a canon of a cathedral, in token of his superiority.

DOMINO. (from *dominus*, as above.) A long, loose cloak, worn at a masquerade, by way of general disguise, by the guests or spectators of this amusement, formerly constituting its superiors: the personifiers of the different characters having been in earlier times hired for this purpose.

DOMINO. (from the above.) A long, loose cloak, worn by the superior ranks in Spain, and not unfrequently for the purpose of concealment.

DOMINO. (from the above.) The game of disguise or concealment; the black backs of the ivory pieces made use of, being turned towards the antagonist party. A game played by two or four persons, with twenty-eight pieces of oblong ivory plates, plain at the back, but on the face divided by a black line in the middle, and indented with spots from one to a double-six. These pieces consist of a double-blank, ace-blank, double-ace, deuce-blank, deuce-ace, double-deuce, trois-blank, trois-ace, trois-deuce, double-trois, four-blank, four-ace, four-deuce, four-trois, double-four, five-blank, five-ace, five-deuce, five-trois, five-four, double-five, six-blank, six-ace, six-deuce, six-trois; six-four; six-five, and double-six. Sometimes a double set is played with, of which double-twelve is the highest.

At the commencement of the game, the cards (as they are called) are shuffled with their faces on the table. Each person draws one, and if four play, those who choose the two highest are partners against those who take the two lowest: drawing the latter also serves to determine who is to lay down the first piece, which is reckoned a great advantage. Afterwards each player takes seven pieces at random. The eldest hand having laid down one, the next must pair him at either end of the piece he may choose, according to the number of pips, or being a blank in the compartment of the piece, but whenever any one cannot match the part not paired either of the card last put down, or of that unpaired at the other end of the row, then he says *go*; and the next is at liberty to play. Thus they play alternately either until one party has wholly discarded, and thereby wins the game, or till the game is *blocked*; that is, when neither party can play by matching the pieces where unpaired at either end, then they win who have the smallest number of pips on the pieces remaining in their possession. It is to the advantage of every player to dispossess himself as early as possible of the heavy pieces, such as double-sixes, fives, fours, &c.

Sometimes when two persons play, they take each only seven pieces, and agree to *play or draw*; i. e. when one cannot come in, or pair with the pieces on the board at the end unmatched, he then is to draw from the fourteen pieces in stock till he find one to pair with one of the end-pieces.

DOMITIANUS (Titus Flavius), son of Vespasian and Flavius Domitilla, made himself emperor of Rome, at the death of his brother Titus, whom, according to some accounts, he destroyed by poison. The beginning of his reign promised tranquillity to the people, but their expectations were soon frustrated. Domitian became cruel, and gave way to incestuous and unnatural indulgences. He commanded himself to be called God and Lord in all the papers which were presented to him. He passed the greatest part of the day in catching flies and killing them with a bodkin. In the latter part of his reign Domitian became suspicious, and his anxieties were increased by the predictions of astrologers, but still more poignantly by the stings of remorse. He was so distrustful even when alone, that round the terrace, where he usually walked, he built a wall with shining stones, that from them he might perceive as in a looking-glass, whether any body followed him. All these precautions were unavailing; he perished by the hand of an assassin the 18th of September, A.D. 96, in the 45th year of his age, and the 15th of his reign. He was the last of the twelve Cæsars. After his death he was publicly deprived by the senate of all the honours which had been profusely heaped upon him, and even his body was left in the open air without the honours of a funeral. This disgrace might perhaps have proceeded from his having once assembled that august body to know in what vessel a turbot might be more conveniently dressed.

DOMUS, in classical antiquity, is commonly used for all sorts of houses, either magnificent or ordinary; but it is often taken by writers to intimate a mansion or fine house of some great lord, or a palace of some prince, as it appears by these verses of Virgil, speaking of the palace of Dido.

"At domus interior regali splendida luxu."

These great houses were built with much magnificence, and were of a vast extent; for they had many courts, apartments, wings, cabinets, bagnios, stoves, and a great many fine halls, either to sit at table, or to transact matters of consequence.

Before these great houses there was a large place or porch, where clients and persons giving attendance to great men waited till it was daylight, to be admitted to make their court. It is supposed that this porch was covered, for the conveniency of persons, who were sometimes waiting very long before they were admitted.

There was a second part to these houses, called *cavum-ædium*, or *cavædium*: it was a spacious court, inclosed with rows of houses.

The third part was called *atrium interius*, i. e. in general the whole inside of the house. Virgil has took this word in Vitruvius's sense, when he said, "Apparet domus intus, et atria longa patescunt;" for it is plain that Virgil means by the word atria, that all may be seen in the inside of a house when the doors are opened. There was a porter waiting at the atrium, called *servus atriensis*. Within this place there were many figures; for the Romans, who passionately loved glory and praises, raised every where trophies and statues, to leave eternal monuments of their great actions to posterity, not only in the provinces, which they subdued to the empire, but also in public places, and their own palaces at Rome.

There were painted or engraven battles, axes, bundles of rods, and the other badges of the offices that their ancestors or themselves had possessed, and statues of wax or metal, representing their fathers in basso relievo, were set up in niches of precious wood or rare marble. The days of their solemn feasts, or their triumphal pomp, these niches were opened, and the figures crowned with festoons and garlands, and carried about the town. When some persons of the family died, these statues accompanied the funeral parade; wherefore Pliny says, that the whole family was there present from the first to the last.

Besides, there were great galleries in these houses, adorned with pillars, and other works of architecture, and great halls, closets for conversation and painting, libraries, and gardens neatly kept.

These halls were built after the Corinthian or Ægyptian order. The first halls had but a row of pillars set upon a pedestal, or on the pavement, and supported nothing but their architrave, and cornish of joiners work or stud, over which was the ceiling in form of a vault; but the last halls had architraves upon pillars, and on the architraves of the ceilings made of pieces joined together, which make an opened terras, turning round about. These houses had many apartments, some for men, and others for women; some for dining-rooms called *triclinia*, others for bed-chambers named *dormitoria*; and some others to lodge strangers, to whom they were obliged to be hospitable.

Ancient Rome was so large, that there were eight and forty thousand houses standing by themselves, being so many insula; and these houses were very convenient, because they had a light on every side, and doors on the streets, and not exposed to the accidents of fire. But this must be understood of Rome, that was rebuilt by Nero, after he had reduced it himself (as it is thought) into ashes.

The Greeks built after another manner than the Romans; for they had no porch, but from the first door they entered into a narrow passage; on one side of it there were stables, and on the other there was the porter's lodge; at the end of this passage there was another door, to enter into a gallery supported with pillars, and this gallery had piazzas on three sides.

Within the Greeks' houses there were great halls, for the mistresses of the family, and their servant maids to spin in; in the entry both on the right and left hand there were chambers, one was called *thalamus*, and the other *antithalamus*. Round about the piazzas there were dining-rooms, chambers, and wardrobes. To this part of the house was joined another part, which was bigger and had very large galleries, with four piazzas of the same height. The finest entries and most magnificent doors were at this part of the house. There were four great square halls, so large and spacious, that they would easily hold four tables, with three seats in form of beds, and leave room enough for the servants and gamesters. They entertained in these halls, for it was not the custom for women to sit amongst men. On the right and the left of these buildings there were small apartments, and very convenient rooms to receive the chance guests; for among the Greeks wealthy and magnificent men kept apartments, with all their conveniencies to receive persons who came far off to lodge at their houses. The custom was, that after they had given them an entertainment the first day only, they sent them afterwards every day some present that they received from the country, as chickens, eggs, pulse, and fruits; and so the travellers were lodged as they had been at their own house, and might live in these apartments privately and in all liberty.

These apartments were paved with mosaic or inlaid work. Pliny tells us, that the pavements that were painted and wrought with art come from the Greeks, who called them λιθοστρωτα. These pavements were in fashion at Rome, during the time of Sylla, who got one made at Præneste, in the temple of Fortune. This Greek word λιθοστρωτον signifies only a pavement of stones, but the Greeks meant by that word those pavements made of small stones of several colours, inlaid into the cement, representing different figures by the variety of their colours and order. This pavement was not only used for paving the courts of houses and the halls, but also in chambers, and wainscotting the walls, and this kind of pavements were called *musæa, musia*, and *musiva*, because ingenious works were ascribed to the muses, and that the muses and sciences were thereby represented. The word mosaic is derived from the Latin word *musivum*, and not from Moses nor the Jews. (*Danet*).

DON. *s.* (*dominus*, Lat.) The Spanish title for a gentleman; as, Don Quixote. See **Dom.**

To **Don.** *v. a.* (*To do on.*) To put on; to invest with: the contrary to *doff* (*Fairfax*).

Don, or **Tanais,** one of the principal rivers of Europe, which separates it from Asia. It rises in the province of Rezan, in Muscovy, and, passing by a great number of towns, falls into the Palus Mæotis, or sea of Asoph. In Britain, there are two rivers of the same name, viz. one in Yorkshire, and one in Aberdeenshire.

DONA'CIA, in entomology, a tribe of the coleopterous genus leptura, thus named in the Fabrician System. See **Leptura.**

DONAGHADEE, a seaport of Ireland, in the county of Down, twenty miles W. by S. of Port Patrick, in Scotland. Between these two places a packet-boat sails every day.

DONARIA, in antiquity, the places where oblations offered to the gods were kept: in after times, the same word denoted the offerings, and sometimes the temples.

DO'NARY. *s.* (*donarium*, Latin.) A thing given to sacred uses.

DONATIA, in botany, a genus of the class triandria, order trigynia. Calyx three-leaved, corol many-petalled. One species; a native of Terra del Fuego; a small simple plant, with sometimes a branch or two forming close tufts; terminal, solitary flowers; petals twice as long as the calyx.

DONATION. *s.* (*donatio*, Latin.) 1. The act of giving any thing (*South*). 2. The grant by which any thing is given or conferred (*Raleigh*).

DONATISTS, ancient schismatics in Africa, so denominated from their leader Donatus. They had their origin in the year 311, when, in the room of Mensurius, who died in that year, on his return to Rome, Cæcilian was elected bishop of Carthage, and consecrated without the concurrence of the Numidian bishops, by those of Africa alone; whom the people refused to acknowledge, and to whom they opposed Majorinus; who, accordingly, was ordained by Donatus, bishop of Casæ Nigræ. They were condemned, in a council held at Rome, two years after their separation; and afterwards in another at Arles, the year following; and again at Milan, before Constantine the Great, in 316. The errors of the Donatists, beside their schism, were, 1. That baptism conferred out of the church, that is, out of their sect, was null; and, accordingly, they re-baptized those who joined their party from other churches, and re-ordained their ministers. 2. That theirs was the only true, pure, and holy church; all the rest of the churches they held as prostitute and fallen.

Donatus seems likewise to have given into the doctrine of the Arians, with whom he was closely allied; and, accordingly, St. Epiphanius, Theodoret, and some others, accused the Donatists of Arianism; and it is probable that the charge was well founded, because they were patronized by the Vandals, who were of these sentiments. But St. Augustine, ep. 185, to count Boniface, et Hær. 69, affirms, that the Donatists, in this point, kept clear of the errors of their leader.

DONATIVE. *s.* (*donatif*, French.) 1. A gift; a largess; a present (*Hooker*). 2. (In law.) A benefice merely given and collated by the patron to a man (*Cowell*).

DONATO (Jerom), a Venetian nobleman of the sixteenth century, famous for his skill as a statesman, and as a man of letters. He was sent by the republic to effect a reconciliation between them and pope Julius II. That pontiff asked him for the title to the claims of Venice to the sovereignty of the Adriatic. "Your holiness, (said the ambassador), will find it on the back of the record of Constantine's donation of the city of Rome, and its territories, to the pope."

DONATUS, a schismatic bishop of Carthage, founder of the sect of Donatists. His followers swore by him, and honoured him like a god. He died about the year 368.

DONAX, in zoology, a genus of the class vermes, order testacea. Animal a tethys; shell bivalve, with generally a crenulate margin; the frontal margin very obtuse; hinge with two teeth, and a single marginal one, placed a little behind; sometimes with it double, and sometimes without any. Nineteen species; scattered through the different seas of the globe: of which three are found on our own shores:

1. D. trunculus. Shell smooth in front, within violet, the margins crenate.

2. D. denticulata. Shell very obtuse in front, the lips transversely wrinkled, finely striate longitudinally, the margin denticulate.

3. D. irus. Shell oval, with transverse waved, erect, striate, membranaceous wrinkles or foliations. Inhabits the Mediterranean, and is found frequently on the shores of Devonshire and Cornwall, buried in the sands. About the size of a small kidney-bean. The anterior parts very obtuse, and marked with arched wrinkles, which are erect and a little reflected, and larger towards the rim. The hinge somewhat resembles that of a Venus. See Plate LXXVII.

DONAWERT, a strong town of Germany, on the frontiers of Suabia, subject to the duke of Bavaria. Lat. 48. 52 N. Lon. 11. 5 E.

DONCASTER, a borough-town in the West Riding of Yorkshire, with a market on Saturdays. This town contains 1246 well-built houses, and 5697 inhabitants. It is governed by a mayor, and has a manufacture of stockings, knit-waistcoats, and gloves. Lat. 53. 33 N. Lon. 1. 12 W.

DONE. The part. pass. of *To do.*

Done. *interject.* The word by which a wager is concluded (*Cleaveland*).

DONEGAL, a county of Ireland, in the province of Ulster, 68 miles long, and 44 broad. It is bounded on the E. by Londonderry and Tyrone, on the W. and N. by the ocean, and on the S. by Fermanagh and the bay of Donegal. It contains forty parishes, and did send twelve members to parliament. It is, in general, a champaign country, and abounds with harbours.

Donegal, a town of Ireland, capital of a county of the same name, seated on the bay of Donegal. Lat. 54. 42 N. Lon. 7. 47 W.

DONERAILE, a town of Ireland, in the county of Cork. Near it are quarries of beautiful variegated marble. Lat. 52. 5 N. Lon. 8. 42 W.

DONGALA, a town of Nubia, with a castle. It contains 10,000 houses of wood, and is seated on the Nile. Lat. 21 N. Lon. 30. 35 E.

DO'NJON. *s.* (now *dungeon.*) The highest and strongest tower of the castle, in which prisoners were kept (*Chaucer*).

DONNINGTON, a town in Lincolnshire, with a market on Saturdays. Lat. 52. 55 N. Lon. 0. 7 W.

DO'NOR. *s.* (from *dono*, Latin.) A giver; a bestower (*Atterbury*).

DO'NSHIP. *s.* (from *don.*) Quality or rank of a gentleman or knight (*Hudibras*).

DONN (Benjamin), an English mathematician, born at Biddeford, in Devonshire, in 1729. He kept a school in that town for some years, and while there made a complete survey of the county, for which he received a premium of 100*l.* from the society for promoting arts and commerce. He also published his Mathematical Essays in octavo, which had a favourable reception, and procured him the office of keeper of the library at Bristol; where he also kept a flourishing academy for some years. In 1771 he printed an Epitome of Natural and Experimental Philosophy, 12mo. and in 1774, a work entitled The British Mariner's Assistant, being a collection of tables for nautical purposes. In 1796 he was appointed master of mechanics to the king. He died in 1798, leaving behind him the character of an ingenious and worthy man. Besides the books above-mentioned, he wrote Treatises on Geometry, Book-keeping, and Trigonometry.

DONNE (Dr. John), an excellent poet and divine of the seventeenth century. His parents were of the Romish religion, and used their utmost efforts to keep him firm to it; but his early examination of the controversy between the church of Rome and the Protestants, at last determined him to choose the latter. He travelled into Italy and Spain, where he made many useful observations, and learned their languages to perfection. Soon after his return to England, sir Thomas Egerton, keeper of the great seal, appointed him his secretary; in which post he continued five years. He marrying privately Anne, the daughter of sir George Moore, then chancellor of the garter, and niece to the lord keeper's lady, was dismissed from his place, and thrown into prison. But he was reconciled to sir George by the good offices of sir Francis Wolley. In 1612 he accompanied sir Robert Drury to Paris. During this time many of the nobility solicited the king for some secular employment for him. But his majesty, who took pleasure in his conversation, had engaged him in writing his Pseudo Martyr, printed at London in 1610; and was so highly pleased with that work, that in 1614 he prevailed with him to enter into holy orders; appointed him one of his chaplains, and procured him the degree of doctor of divinity from the university of Oxford. In 1619 he attended the earl of Doncaster in his embassy into Germany. In 1621 he was made dean of St. Paul's: and the vicarage of St. Dunstan in the west, in London, soon after fell to him; the advowson of it having been given to him long before by Richard, earl of Dorset. By these and other preferments, he was enabled to be charitable to the poor, kind to his friends, and to make good provision for his children. He wrote, besides the above, 1. Devotions upon emergent Occasions. 2. The Ancient History of the Septuagint, translated from the Greek of Aristeus, quarto. 3. Three volumes of Sermons, folio. 4. A considerable number of Poems; and other works. He died in 1631, and was interred in St. Paul's cathedral, where a monument was erected to his memory. His writings show him to be a man of incomparable wit and learning; but his greatest excellence was satire. He had a prodigious richness of fancy, but his thoughts were much debased by his versification. He was, however, highly esteemed by all the great men of that age.

DOOAB, or **Doobah**, a fertile tract of Hindustan Proper, between the Ganges and Jumna, and formed by the confluence of those rivers. The principal part of it is subject to the nabob of Oude.

DOO'DLE. *s.* A trifler; an idler.

DOOLS, a term used in several parts of the kingdom for balks, or slips of pasture, left between the furrows of ploughed lands.

To **DOOM.** *v. a.* (deman, Saxon.) 1. To judge (*Milton*). 2. To condemn to any punishment; to sentence (*Smith*). 3. To pronounce condemnation upon any (*Dryden*). 4. To command judicially or authoritatively (*Shakspeare*). 5. To destine; to command by uncontrollable authority (*Dryden*).

Doom. *s.* (dom, Saxon.) 1. Judicial sentence; judgment (*Milton*). 2. The great and final judgment (*Shakspeare*). 3. Condemnation (*Shakspeare*). 4. Determination declared (*Shakspeare*). 5. The state to which one is destined (*Dryden*). 6. Ruin; destruction (*Pope*).

DO'OMSDAY. *s.* (*doom* and *day.*) 1. The day of final and universal judgment; the last, the great day (*Brown*). 2. The day of sentence or condemnation (*Shakspeare*).

DO'OMSDAY-BOOK. See DOME'S-DAY-BOOK.

DOON (Loch), a lake of Ayrshire, in the district of Kyle, six miles in length, and of considerable breadth. A river of the same name issues from this lake, and falls into the frith of Clyde.

DOOR. *s.* (ꝺoꞃ, ꝺoꞃe, Saxon.) 1. The gate of a house; that which opens to yield entrance (*Denham*). 2. In familiar language, a house (*Arbuthnot*). 3. Entrance; portal (*Dryden*). 4. Passage; means of approach (*Hammond*). 5. *Out of* DOOR, or DOORS. No more to be found; quite gone; fairly sent away (*Locke*). 6. *At the* DOOR *of any one.* Imputable; chargeable upon him (*Dryden*). 7. *Next* DOOR *to.* Approaching to; near to; bordering upon (*L'Estrange*).

DOOR, in architecture, an aperture in a wall, to give entrance and exit in and out of the building, or some apartment thereof. Most of the observations that are applicable to windows may be applied to doors.

It is an observation of Palladio, that the principal door, or entrance of a house, must never be regulated by any certain dimensions, but by the dignity of the person that is to live in it: yet, to exceed rather in the more, than the less, is a mark of generosity; and may be excused with some noble emblem, or inscription, as that of the conte de Bevilacqua over his large gate at Verona, where had been committed a like disproportion, *patet Janua, cor magis*. The principal door should, unless it be very inconvenient, stand in the centre of the front.

Inside-doors, however small the building may be, should never be narrower than two feet nine inches; nor should they ever, in private houses, exceed three feet six inches in breadth, which is more than sufficient to admit the bulkiest person. Their height should at least be six feet three or four inches; otherwise a tall person cannot pass without stooping. In churches, palaces, &c. where there is a constant ingress and egress of people, the apertures must be larger.

DO'ORCASE. *s.* (*door* and *case*.) The frame in which the door is enclosed (*Moxon*).

DOOR-HINGE. See HINGE.

DO'ORKEEPER. *s.* (*door* and *keeper*.) Porter; one that keeps the entrance of a house (*Tay.*).

DOQUET, a paper containing a warrant.

DORADO, or DORY, in ichthyology. See ZEUS.

DORADO, in astronomy. See XIPHIAS.

DORÆ'NA, in botany, a genus of the class pentandria, order monogynia. Corol five-cleft; stigma notched; capsule one-celled, one-valved, many-seeded. One species; a native as is supposed of Japan; a dwarf tree, with alternate branches; white, minute flowers, in lateral racemes.

DORCHESTER, the capital of Dorsetshire, with markets on Wednesdays and Saturdays. It is a town of great antiquity. It now has three parishes, 353 houses, 2402 inhabitants, sends two members to parliament, and is governed by a mayor. It is seated on the river Frome, and has been long celebrated for its strong beer. Lat. 50. 42 N. Lon. 2. 45 W.

DORCHESTER, a town in Oxfordshire, which was a station of the Romans, and ruined in the wars with the Danes. It was a bishop's see till 1086, when William the Conqueror translated it to Lincoln; and it had five stately churches, though now but one. Lat. 51. 39 N. Lon. 1. 0 W.

DORDOGNE, a department of France, which includes the late province of Perigord. It receives its name from a river which rises in the mountains of Auvergne, and falls into the Garonne near Bourdeaux.

DOREE, or JAUNE DORE'E, whence we have John Dory, in ichthyology. See ZEUS.

DORIAN, in ancient music, the fourth species of the diapason.

DORIC, in architecture, is the second of the five orders, being that between the Tuscan and Ionic: its character is grave, robust, and masculine; hence, it is often termed the Herculean order.

At its first invention it was more simple than at present; and when in after-times they came to adorn and enrich it more, the appellation Doric was restrained to this richer manner, and the primitive simple manner they called by a new name, the Tuscan order, which was chiefly used in temples; as the former, being somewhat more light and delicate, was for porticos and theatres. The tradition is, that Dorus, king of Achaia, having first built a temple of this order at Argos, which he dedicated to Juno, occasioned it to be called Doric; though others derive its name, from its being invented or used by the Dorians.

For the description of the principal parts which compose this order, we refer to sect. vi. of our Treatise on ARCHITECTURE, Plate 3 and 16.

DORIC DIALECT, in grammar, one of the five dialects, or manners of speaking which were principally in use among the Greeks.

It was first used by the Lacedæmonians, and particularly those of Argos; thence it passed into Epirus, Libya, Sicily, the islands of Rhodes and Crete.

In this dialect, Archimedes and Theocritus wrote, who were both of Syracuse; as likewise Pindar.

The general rules of this dialect are thus given by the Port-royalists:

> D'ι ητα, d'ω grand, d'ι, do & d'ε l'α fait le
> Dore.
> D'ει fait ητα; d'υ, ω; & d'ω αυ fait encore.
> Oste ι de l'infini: & pour le singulier
> Se sert au femenin du nombre plurier.

But they are much better explained in the fourth book of Rulandus; where he even notes the minuter differences of the dialects of Sicily, Crete, Tarentum, Rhodes, Lacedæmon, Laconia, Macedónia, and Thessaly.

DORIC MODE, in music, the first of the authentic modes of the ancients. Its character is to be severe, tempered with gravity and joy;

and is proper upon religious occasions, as also to be used in war. It begins *D*, *la*, *sol*, *re*. Plato admires the music of the Doric mode, and judges it proper to preserve good manners as being masculine; and on this account allows it in his commonwealth. The ancients had likewise their subdoric or hypodoric mode, which was one of the plagal modes. Its character was to be very grave and solemn: it began with *re*, a fourth lower than the Doric.

DORIS, in zoology, a genus of the class vermes, order mollusca. Body creeping, oblong, and flat beneath: mouth placed below on the fore-part; vent behind on the back, and surrounded by a fringe. Feelers from two to four, seated on the upper part of the body in front, and retractile within their proper receptacles. Twenty-four species; some with four tentacles or feelers; some with only two. Generally found in the European seas, north or south, adhering to floating timber, or sea-weeds, or zoophytes; some of them move like naked snails. There are three found on our own coasts; of which one,

D. argo, is usually called the sea-lemon, with oval body, smooth; two feelers at the mouth; vent surrounded by a ramified fringe; body red, with sulphur spots and black dots; length three inches and a half.

The most splendid of the tribe is d. radiata, about an inch long, found in the ocean around the West Indies. Body pale blue, with a silver gloss; the margin and tips of all the papillæ rich blue; obtuse in front, and tapering to a fine point behind.

Doris, a country of Greece, between Phocis, Thessaly, and Acarnania. It received its name from Dorus, the son of Deucalion, who made a settlement there. It was called Tetrapolis, from the four cities which it contained.

DO'RMANT. *a.* (*dormant*, Fr.) 1. Sleeping (*Congreve*). 2. In a sleeping posture (*Brown*). 3. Private; not publick (*Bacon*). 4. Concealed; not divulged (*Swift*). 5. Leaning; not perpendicular (*Cleaveland*).

Dormant-tree, in building, a summer-beam.

DORMER, in architecture, a window made in the roof of a house, being raised upon the rafters: it is often called a luthern.

DO'RMITORY. *s.* (*dormitorium*, Latin.) 1. A place to sleep in; a room with many beds (*Mortimer*). 2. A burial place (*Ayliffe*).

DORMOUSE, in mastiology. See Myoxus.

DORN. *s.* (from *dorn*, German, a thorn.) A fish; the thornback (*Carew*).

DO'RNICK. *s.* (of *Deornick*, in Flanders, where first made.) A species of linen cloth used in Scotland for the table.

DORNOCH, the county-town of Sutherlandshire, at the entrance of a frith of the same name, over which there is a ferry to Tain. Lat. 57. 52 N. Lon. 3. 48 W.

DORO'NICUM. Leopard's bane. In botany, a genus of the class syngenesia, order polygamia superflua Receptacle naked; down simple; calyx scales in a double row, equal, longer than the disk; seeds of the ray naked and without down. Six species; all European plants: but of which the two following are alone worth noticing.

1. D. pardalianches. A native of Germany; leaves denticulate, uppermost roundish-hearted; middle ones spatulate-hearted; lower and radical ones heart-shaped, petioled. The flowers are yellow: and the plant is often cultivated in our own gardens, which it may be by its seeds, and that so readily, as where it once takes root, to overrun the entire garden. The plant is known in old pharmacopœias under the name of doronicum Romanum: its root, if given largely, exhibits poisonous properties; but instances are upon record of its efficacy in epileptic and other nervous diseases.

2. D. austriacum. Leaves denticulate; uppermost lanceolate, clasping; lower ones spatulate-ovate; radical ones heart-shaped, petioled. It is found wild in our own mountainous pastures, and in some vernacular floras is denominated, like the former, d. pardalianches.

To DORR. *v. a.* (*tor*, stupid, Teutonick.) To deafen or stupify with noise (*Skinner*).

Dorr. *s.* A kind of flying insect; the hedge-chafer (*Grew*).

DORSAL. (from *dorsum*, back.) Any thing that belongs to the back; as dorsal glands, dorsal nerves, dorsal muscles, &c.

Dorsal awn. (*dorsalis arista.*) In botany, fixed to the back or outer side of the glume, not springing from the end: as in bromus and avena. *Lateri exteriori glumæ imposita.*

DO'RSEL. Do'rser. *s.* (from *dorsum*, the back.) A pannier; a basket or bag, one of which hangs on either side of a beast of burden.

DORSETSHIRE, a county of England, bounded on the N. by Somersetshire and Wiltshire; on the E. by Hampshire; on the S. by the English channel; and on the W. by Devonshire and Somersetshire; extending 50 miles in length from E. to W. and 38 from N. to S. where broadest; containing 22 market-towns, 248 parishes, 22,262 houses, and 115,319 inhabitants. It sends 20 members to parliament, and contains 610,000 acres of land, 85,000 of which are uncultivated, including woodlands. The air is for the most part very good and wholesome. On the hills it is somewhat bleak and sharp, but it is very mild and pleasant near the coast. The soil is generally rich and fertile, though in some parts very sandy. The northern part, which is divided by a range of chalk hills from the southern, was anciently overspread with forests, but now affords good pasture for cattle; while the southern part chiefly consists of fine downs, and feeds incredible numbers of sheep. The chalk hills, which run through every county from the S.E. part of the kingdom thus far, terminate at the farther extremity of this; but on the coast, chalk cliffs extend beyond it into Devonshire, ten miles W. of Lyme. This county sends 411 men to the national militia.

DORSI SPINALIS, in anatomy. See SPINALIS DORSI.

DORSTE'NIA. So called in honour of Dr. Dorsten. In botany, a genus of the class tetrandria, order monogynia. Receptacle common, one-leaved, fleshy, in which the seeds are separately imbedded. Eleven species; almost all natives of the West Indies or South America. They are low, herbaceous plants, with roots full of knots, an inch or two in length, about half an inch thick, externally of a reddish brown colour, but pale within. The contrayerva of the dispensaries is obtained almost indiscriminately from the roots of three of these species. D. contrajerva; d. Houstoni, so named from Dr. Houston; d. Drakena, so named from sir Francis Drake. See CONTRAYERVA.

DORT, or DORDRECHT, a strong town of Holland, in the United Provinces, famous for a synod held there in 1618, when the opinions of Arminius and his followers were condemned. It is seated on an island formed by an inundation of the sea, which, in 1421, swallowed up 70 villages, and 100,000 people. It is 37 miles almost S. of Amsterdam. Lat. 51. 50 N. Lon. 4. 48 E.

DORTMUND, a strong imperial town of Westphalia, in the county of Marck, seated on the Emster. Lat. 51. 26 N. Lon. 7. 35 E.

DO'RTURE. *s.* (from *dormiture*, *dortoir*, Fr.) A dormitory; a place to sleep in (*Bacon*).

DORY, or JOHN DORY, in ichthyology. See ZEUS.

DORY'CRINUM, in botany, a genus of the class diadelphia, order decandria. Calyx five-toothed, two-lipped; filaments subulate; stigma capitate; legume turgid, one or two-seeded. Three species; natives of the south of France, and the Levant.

DO'RYLUS, in zoology, a tribe of hymenopterous insects, belonging to the genus mutilla; thus denominated in the system of Fabricius.

DORYPHORI. (from δοϱυ, spear, and φεϱω, I bear.) An appellation given to the life-guard men of the Roman emperors.

DOSE. *s.* (δοσις.) 1. So much of any medicine as is taken at one time (*Quincy*). 2. Any thing nauseous (*South*). 3. As much of any thing as falls to a man's lot (*Hudibras*). 4. Quantity (*Granville*).

To DOSE. *v. a.* To proportion a medicine properly to the patient or disease (*Derham*).

DOSITHEANS, DOSITHEI, an ancient sect among the Samaritans, in the first century of the Christian æra.

Mention is made in Origen, Epiphanius, Jerom, and divers other Greek and Latin fathers, of one Dositheus, the chief of a faction among the Samaritans; but the learned are not at all agreed as to the time wherein he lived. St. Jerom, in his Dialogue against the Luciferians, places him before our Saviour; wherein he is followed by Drusius, who, in his answer to Serrarius, places him about the time of Sennacherib, king of Assyria; but Scaliger will have him posterior to our Saviour's time. And, in effect, Origen intimates him to have been contemporary with the apostles; where he observes, that he endeavoured to persuade the Samaritans, that he was the Messiah foretold by Moses.

Archbishop Usher takes Dositheus to be the author of all the changes made in the Samaritan Pentateuch; which he argues from the authority of Eulogius: but all we can justly gather from the testimony of Eulogius is, that Dositheus corrupted the Samaritans copies since used by that sect; but that corruption did not pass into all the copies of the Samaritan Pentateuch, now in use among us, which vary but little from the Jewish Pentateuch.

Tertullian, making mention of the same Dositheus, observes, that he was the first who dared to reject the authority of the prophets, by denying their inspiration. But he charges that as a crime peculiar to this sectary, which, in reality, is common to the whole sect, who have never allowed any but the five books of Moses for divine.

DO'SSIL. *s.* (from *dorsel.*) A pledget; a lump of lint to be laid on a sore (*Wiseman*).

DOST. The second person of *do*.

DOT. *s.* (from *jot*, a point.) A small point or spot made to mark any place in a writing.

DOT, in music, a point placed after a note, which increases the duration of that note by one half. If another dot be placed after this dot, the increase is augmented by its half; or the original note is lengthened by three-fourths of its value.

To DOT. *v. n.* (from the noun.) To make dots or spots.

DO'TAGE. *s.* (from *dote.*) 1. Loss of understanding: imbecility of mind; deliriousness (*Dav. Suck.*). 2. Excessive fondness (*Dry.*).

DOTAL. *a.* (*dotalis*, Latin.) Relating to the portion of a woman (*Garth*).

DO'TARD. *s.* (from *dote.*) A man whose age has impaired his intellects (*Spenser*).

DOTA'TION. *s.* (*dotatio*, Lat.) The act of giving a dowry or portion.

To DOTE. *v. n.* (*doten*, Dutch.) 1. To have the intellect impaired by age or passion: to be delirious (*Jeremiah*). 2. To be in love to extremity (*Sidney*). 3. *To* DOTE *upon.* To regard with excessive fondness; to love to excess (*Burnet*).

DO'TER. *s.* (from *dote.*) 1. One whose understanding is impaired by years: a dotard (*Burton*). 2. A man fondly, weakly, and excessively in love (*Boyle*).

DO'TINGLY. *ad.* (from *doting.*) Fondly (*Dryden*).

DO'TTARD. *s.* A tree kept low by cutting (*Bacon*).

DOTTED LEAF. (*folium punctatum.*) In botany, besprinkled or pounced with hollow dots or points. Quod punctis excavatis adspersum est. As in anthemis maritima. Applied also to the receptacle; as in leontodon, cacalia, ethulia, xeranthemum, chrysanthemum, othonna.

DOTTEREL, in ornithology. See Charadrius.

DOUAY, a considerable town of France, in the department of the North, and late French Flanders. It has a fine arsenal, a foundery for cannon, and a military school. Lat. 50. 22 N. Lon. 3. 10 E.

DO'UBLE. *a.* (*double*, French.) 1. Two of a sort; one corresponding to the other; in pairs (*Ecclus*). 2. Twice as much; containing the same quantity repeated (*Ben Jonson*). 3. Having one added to another; having more than one in the same order or parallel (*Bacon*). 4. Twofold; of two kinds (*Dryden*). 5. Two in number (*Davies*). 6. Having twice the effect or influence (*Shakspeare*). 7. Deceitful; acting two parts (*Shakspeare*).

Do'uble. *ad.* Twice over (*Bacon*).

To **Do'uble.** *v. a.* (from the adjective.) 1. To enlarge any quantity by addition of the same quantity (*Shakspeare*). 2. To contain twice the quantity (*Dryden*). 3. To repeat; to add (*Dryden*). 4. To add one to another in the same order or parallel (*Exodus*). 5. To fold (*Prior*). 6. To pass round a headland (*Knolles*).

To **Do'uble.** *v. n.* 1. To increase to twice the quantity (*Burnet*). 2. To enlarge the stake to twice the sum in play (*Dryden*). 3. To turn back, or wind in running (*Bacon*). 4. To play tricks; to use sleights.

Do'uble. *s.* 1. Twice the quantity or number (*Graunt*). 2. Strong beer; beer of twice the common strength (*Shakspeare*). 3. A turn used to escape pursuit (*Blackmore*). 4. A trick; a shift; an artifice (*Addison*).

Double, in botany. Double leaves: two connected by one petiole. Double stipules: two and two by pairs. Double peduncle: two from the same point. Different from Two-flowered and Twin, which see.

Double, in hare-hunting. The hare is said to double, when, being considerably ahead of the hounds, she throws herself to the right or left, and returns in a parallel line to the track she went before; getting into which, she is said to run the foil. If during the chase she lies down, she is then said to squat.

Double, in the manage. A horse is said to double the reins, when he leaps several times successively in order to throw his rider.

DOUBLE-BASS, or Violono, a large, deep-toned bass stringed instrument, the tones of which are an octave below those of the violoncello.

DO'UBLE-BITING. *a.* Biting or cutting on either side (*Dryden*).

DO'UBLE-BUTTONED. *a.* Having two rows of buttons (*Gay*).

DOUBLED, in music, the D below G gammut.

DOU'BLE-DEALER. *s.* A deceitful, subtle, insidious fellow; one who says one thing and thinks another (*L'Estrange*).

DO'UBLE-DEALING. *s.* Artifice; dissimulation; low or wicked cunning (*Pope*).

To **DO'UBLE-DIE.** *v. a.* To die twice over.

DOUBLE EMPLOYMENT, in music, a name given by M. Rameau to the two different ways in which the chord of the sub-dominant may be regarded and treated, viz. as the fundamental chord of the sixth superadded, or as the chord of the greater sixth, inverted from fundamental chord of the seventh. In reality, the chords carry exactly the same notes, are figured in the same manner, are employed upon the same chord of the tone, in such a manner that frequently we cannot discern which of the two chords the author employs, but by the assistance of the subsequent chord, which resolves it, and which is different in these different cases. To make this distinction, we must consider the diatonic progress of the two notes which form the fifth and the sixth, and which, constituting between them the interval of a second, must one or the other constitute the dissonance of the chord. Now, this progress is determined by the motion of the bass. Of these two notes, then, if the superior be the dissonance, it will rise by one gradation into the subsequent chord, the lower note will keep its place, and the higher note will be a superadded sixth. If the lower be the dissonance, it will descend into the subsequent chord, the higher will remain in its place, and the chord will be that of the great sixth.

DO'UBLE-HEADED. *a.* Having the flowers growing one to another (*Mortimer*).

DOUBLE-LETTER, in grammar, a letter which has the force and effect of two; as the Hebrew *tsade*, which is equivalent to T and S; or the Greek ξ, or Latin *x*, &c.

These letters are evidently equal to two; when we pronounce the Latin *axis*, or the English axillary, we give the *x* the same sound, as if it were written with two *cc*, *accis*, accillary; or a *c* and *s*, *acsis*, acsillary.

The Greeks have three, Ζ, Ξ, Ψ; the Latins only two, X and Z; and most of the modern languages have the same.

To **DO'UBLE-LOCK.** *v. a.* To shoot the lock twice (*Tatler*).

DO'UBLE-MINDED. *a.* Unsettled; undetermined (*James*).

DOUBLE-OCTAVE, in music, an interval composed of fifteen notes in diatonic progression; and which, for that reason, is called a fifteenth. "It is (says Rousseau) an interval composed of two octaves, called by the Greeks *disdiapason*."

DO'UBLE-PLEA. *s.* That in which the defendant alleges for himself two several matters, whereof either is sufficient to effect his desire in debarring the plaintiff (*Cowell*).

DOUBLE-POINT, in the higher geometry, is a point which is common to two legs or branches of some curve of the second or higher order: such as an infinitely small oval, or a cusp, or the cruciform intersection of some curve. See Curve.

DO'UBLE-SHINING. *a.* Shining with double lustre (*Sidney*).

DO'UBLE-TONGUED. *a.* Deceitful; giving contrary accounts of the same thing (*Dryden*).

DOUBLE-TONGUEING, in music, a particular motion of the lips, adopted by players on the German flute, to give a brilliant, yet distinct articulation to rapid divisions. In order to this, Mr. Gunn recommends a kind of action and re-action, by pronouncing distinctly the syllables *diddle, diddle,* of which the first syllable articulates one note; and the second is articulated, but in a less distinct manner, by the re-action of the tongue in the second syllable.

DOUBLED TOGETHER, in botany. See Conduplicate.

DO'UBLENESS. *s.* (from *double.*) The state of being double (*Shakspeare*).

DO'UBLER. *s.* He that doubles any thing.

Doubler, in electricity. See Electricity.

DO'UBLET. *s.* (from *double.*) 1. The inner garment of a man; the waistcoat (*Hudibras*). 2 Two; a pair (*Grew*).

DOUBLETS, a game on dice within tables; the men, which are only fifteen, being placed thus: Upon the size, cinque, and quatre points, there stand three men a-piece; and upon the trey, duce, and ace, only two. He that throws highest has the benefit of throwing first, and what he throws he lays down, and so does the other: what the one throws, and has not, the other lays down for him, but on his own account; and thus they continue till all the men are down, and then they bear. He that is down first, bears first; and will doubtless win the game, if the other throw not doublets to overtake him: which he is sure to do, since he advances or bears as many as the doublets make, viz. eight for two fours.

DOUBLING, in the military art, is the putting two ranks or files of soldiers into one, Thus, when the word of command is, double your ranks, the second, fourth, and sixth ranks march into the first, third, and fifth, so that the six ranks are reduced to three, and the intervals between the ranks become double what they were before. To double by half-files, is when the fourth, fifth, and sixth ranks march up to double the first, second, and third, or the contrary. To double the files to the right, is when every other file faces to the right, and marches into the next file to it, so that the six ranks are turned into twelve, and every file is twelve deep. To double the files to the left, is when every other file faces to the left, and marches into the next. In doubling the files, the distance between the files becomes double.

Doubling, in navigation, the act of sailing round a cape, point of land, &c. so as that the cape or point of land becomes between the ship and her former situation.

DOUBLINGS, in heraldry, the linings of robes and mantlings in achievements.

DOUBLON, or Doubloon, a Spanish and Portuguese coin, being the double of a pistole.

DO'UBLY. *ad.* (from *double.*) In twice the quantity; to twice the degree (*Dryden*).

Doubly-compound. In botany. See Decompound.

Doubly-crenate leaf. In botany. Having small notches on the larger.

Doubly-pinnate. In botany. See Bipinnate.

Doubly-serrate. In botany. Duplicato-serratum. Having small teeth on the larger.

Doubly-ternate. In botany. See Biternate.

To DOUBT. *v. n.* (*doubter,* French.) 1. To question; to be in uncertainty (*Tillotson*). 2. To question any event, fearing the worst (*Shakspeare*) 3. To fear; to be apprehensive of ill (*Baker*). 4. To suspect; to have suspicion (*Daniel*). 5. To hesitate; to be in suspense (*Dryden*).

To Doubt. *v. a.* 1. To hold questionable; to think uncertain. 2. To think endangered (*Milton*). 3. To fear; to suspect (*Bacon*). 4. To distrust; to hold suspected (*Pope*).

The words doubt and but are frequently used erroneously in grammatical construction: an ingenious writer in the Monthly Magazine for Jan. 1804, gave a curious exposition of this matter by the aid of mathematical signs; we shall here insert it for the amusement of our readers, especially as a similar method may be sometimes applied to the solution of other grammatical questions.

I.

1. I *think* it.
   I *doubt* it.
2. I do not *doubt* that I shall; or
   I do not *think* that I shall not.
3. I do not *doubt* that I shall; or
   I *think* that I shall.

Cor. Thus, 1. *doubt* and *think* are opposite.
2. *doubt* is equivalent to *think not*; and,
3. *think* is equivalent to *doubt not*.
Or, adopting the positive and negative signs of algebra,
2. + *doubt* = − *think*; and
3. + *think* = − *doubt*.

II.

1. I do not think *that* I shall.
   I do not think *but* I shall.
2. I do not think *but* I shall; or,
   I do not think *that* I shall *not*.
3, I do *not* think *but* I shall; or,
   I think *that* I shall.

Cor. Thus, 1. *that* and *but* are opposite:
2. *but* is equivalent to *that not*; and
3. *that* is equivalent to *but not*.
Algebraically,
2. + *but* = − *that*; and
3. + *that* = − *but*.

III.

Then,
1. I do not *doubt that* I shall (I. 2, 3.), and
   I do not *think but* I shall (II. 2. 3.), being each equivalent to
2. I do *not think* that I shall *not* (I. 2, II. 2.), and to
   I *think* that I shall, (I. 3, II. 3:)

Cor. The former two phrases are equivalent to each other; whence

1. *doubt that* is equivalent to *think but*, algebraically—*think that* (I. 2.)=*think*—*that* (II. 2):

    And the latter two phrases are also equivalent to each other; whence

2. two opposing negatives are equivalent to an affirmative, (algebraically,—*think*—*that* = +*think that*.)

IV.

Hence, by I.,
I do not think but I shall; and,
I do not doubt but I shall,
must be *opposite:* And,
I DO NOT DOUBT THAT I SHALL
will be equivalent to,
I do not think that I shall not, or (III. *Cor.* 2.)
I THINK THAT I SHALL.

Also, by II.,
I do not doubt that I shall; and,
I do not doubt but I shall,
must be *opposite:* And,
I DO NOT DOUBT BUT I SHALL
will be equivalent to,
I do not doubt that I shall not; or (III. *Cor.* 2.)
I doubt that I shall, i. e. (I. *Cor.* 2.)
I THINK THAT I SHALL NOT.

Johnson explains *But* (see its thirteenth sense in his Dictionary) as being "used after *no doubt, no question*, and such words, and signifying the same with *that*." It is curious that in every one of the three examples which he quotes, it means strictly the contrary to *that* (or, algebraically—*that*), and the use of *that* alone will express a meaning precisely opposite.

But is used in the same erroneously indiscriminate manner after the verbs *to deny*, *dispute*, *question*, *believe*, *think*, *&c.* and also after such words as *impossible improbable*, &c. in all which cases *that* should be substituted for *but*.

DOUBT. *s.* (from the verb.) 1. Uncertainty of mind; suspense (*South*). 2. Question; point unsettled (*Pope*). 3. Scruple; perplexity; irresolution (*Shakspeare*). 4. Uncertainty of condition (*Deuteronomy*). 5. Suspicion; apprehension of ill (*Galatians*). 6. Difficulty objected (*Blackmore*).

DO'UBTER. *s.* (from *doubt*.) One who entertains scruples; one who hangs in uncertainty.

DO'UBTFUL. *a.* (*doubt* and *full*.) 1. Dubious; not settled in opinion (*Shakspeare*). 2. Ambiguous; not clear in its meaning. 3. Obscure; questionable; uncertain (*Dryden*). 4. Hazardous; of uncertain event (*Milton*). 5. Not secure; not without suspicion (*Hooker*). 6. Not confident; not without fear (*Milton*). 7. Partaking of different qualities (*Milton*).

DO'UBTFULLY. *ad.* 1. Dubiously; irresolutely. 2. Ambiguously; with uncertainty of meaning (*Spenser*).

DO'UBTFULNESS. *s.* (from *doubtful*.) 1. Dubiousness; suspense; instability of opinion (*Watts*). 2. Ambiguity; uncertainty of meaning (*Locke*). 3. Hazard; uncertainty of event.

DO'UBTINGLY. *ad.* (from *doubt*.) In a doubting manner; dubiously (*Bacon*).

DO'UBTLESS. *a.* (from *doubt*.) Free from fear; void of apprehension of danger (*Shakspeare*).

DO'UBTLESS. *ad.* Without doubt; unquestionably (*Woodward*).

DOUCET. *s.* (*doucet*, French.) A custard (*Skinner*).

DOUCINE, in architecture, the same as CYMATIUM or GULA.

DOVE, in ornithology. See COLUMBA.

DO'VECOT. *s.* (*dove* and *cot*.) A small building in which pigeons are bred and kept (*Shakspeare*).

DO'VEHOUSE. *s.* (*dove* and *house*.) A house for pigeons (*Dryden*).

DOVE'S-FOOT, in botany. See GERANIUM.

DOVE-TAILING, in joinery, a very excellent method of fastening boards together, by letting one piece into another: the tenon, or piece of wood which is put in, goes widening to the extreme, so that it cannot be drawn out obliquely without breaking the stuff.

DOVELLA, in ichthyology. See LABRUS.

DOVER (the ancient Dubris), a seaport of Kent, with markets on Wednesdays and Saturdays. It is strong both by nature and art. This town contains 3570 houses, and 14,845 inhabitants. It is one of the cinque ports, and a corporation, governed by a mayor and 12 jurats, and sending two members to parliament. From this place to Calais packet-boats are regularly passing in time of peace. Here is an ancient castle, built on a high hill, E. from the town. The harbour is made by a gap in the cliffs, which are here of a sublime height, though certainly exaggerated in Shakspeare's celebrated description. Lat. 51. 8 N. Lon. 1. 24 E.

DOVER, a town in the county of Kent, and state of Delaware, in N. America. It is the seat of the government, and stands on Jones's Creek. Lat 39. 10 N. Lon. 75. 30 W.

DOVER STRAITS, the narrow channel between Dover and Calais, which separates our island from the opposite continent. Britain is supposed by many to have been once peninsulated, the present straits occupying the site of the isthmus which joined it to Gaul. These celebrated straits are only 21 miles wide in the narrowest part. From the pier at Dover to that of Calais is 24. The spring tides in the straits rise, on an average, 24 feet, the neap-tides, 15 feet.

DOUGH. *s.* (dah, Saxon.) 1. The paste of bread yet unbaked (*Dryden*). 2. *My cake is* DOUGH. My affair has miscarried (*Shak.*).

DOUGHBA'KED. *a.* (*dough* and *baked*.) Unfinished; not hardened to perfection (*Donne*).

DOUGLAS (Gawin), a Scotch poet and bishop, was the younger son of the sixth earl of Angus, and born at Brechin in 1471. After going through his academical studies, he went to Italy, where he acquired a taste for poetry. On his return to his own country he obtained some ecclesiastical preferment, and in 1515 the bishopric of Dunkeld. He had afterwards the rich abbey of Aberbrothic added to his bishopric. He died at London in 1522. His works are: 1. A Translation of Virgil's Æneis. 2. The Palace of Honour, a poem. 3. Aureæ Narrationes, Comediæ aliquot Sacræ. 4. De Rebus Scoticis Liber.

Douglas, a seaport in the Isle of Man, having the best harbour in the island, and the best mart for trade. It is a populous, improving town, and has an ancient fort near the harbour. Lat. 54. 12 N. Lon. 4. 20 W.

DO'UGHTY. *a.* (dohtig, Saxon.) Brave; noble; illustrious; eminent (*Spenser*). This word is now commonly used ironically.

DO'UGHY. *a.* (from *dough.*) Unsound; soft; unhardened (*Shakspeare*).

DOURLACH, a town of Suabia, capital of Baden-dourlach. Lat. 49. 2 N. Lon. 9. 28 E.

DOURO, a river which rises in Old Castile, in Spain, and running across Portugal, falls into the Atlantic, a little below Porto.

DOUSA (James), a learned Dutchman, born in 1545. He became eminent both as a scholar and as a soldier, and obtained in 1574 the government of Leyden. The year following a university was founded there, and Dousa made the first curator. He died in 1604. His son James, born in 1572, distinguished himself while a mere child, by his Latin poems. He also wrote notes upon Plautus, and at the age of 16 published his book, De Rebus Celistibus, and his Panegyric on a Shadow. He became tutor to the prince of Orange, and librarian of the university of Leyden. He died in 1597. (*Watkins*).

To **DOUSE.** *v. a.* (δυσις.) To put over head suddenly in the water.

To **Douse.** *v. n.* To fall suddenly into the water (*Hudibras*)

DOW (Gerard), an eminent painter, born at Leyden, in 1613. He was the disciple of Rembrandt, and acquired uncommon excellence in painting in miniature; and his pictures are so exquisitely touched, so transparent, and so wonderfully delicate, as to excite astonishment as well as pleasure. He died in 1674. (*Watkins*).

DO'WAGER. *s.* (*douairiere*, French.) 1. A widow with a jointure (*Shakspeare*). 2. The title given to ladies who survive their husbands (*Shakspeare*).

DO'WDY. *s.* An awkward, ill-dressed, inelegant woman (*Shakspeare*).

DO'WER. Do'wery. *s.* (*douaire*, Fr.) 1. That which the wife brings to her husband in marriage (*Pope*). 2. That which the widow possesses (*Bacon*). 3. The gifts of a husband for a wife (*Genesis*). 4. Endowment; gift (*Davies*).

Dower, the portion which a widow hath of the lands of her husband, after his decease, for the sustenance of herself, and the education of her children.

Dower by the common law, is a third part of such lands or tenements whereof the husband was sole seised in fee-simple, or fee-tail, during the marriage, which the wife is to enjoy during her life; for which there lies a writ of dower.

Dower by custom. This kind of dower varies according to the custom and usage of the place, and is to be governed accordingly; and where such custom prevails, the wife cannot wave the provision thereby made for her, and claim her thirds at common law, because all customs are equally ancient with the common law itself.

Dower ad ostium ecclesiæ, is where a man of full age, seised of lands in fee, after marriage, endows his wife at the church door of a moiety, a third, or other part of his lands, declaring them in certainty; in which case, after her husband's death, she may enter into such lands without any other assignment, because the solemn assignment at the church door is equivalent to the assignment *in pais* by metes and bounds; but this assignment cannot be made before marriage, because before she is not entitled to the dower.

Dower ex assensu patris, is where the father is seised of lands in fee; and his son and heir apparent after marriage endows his wife by his father's assent, *ad ostium ecclesiæ*, of a certain quantity of them; in which case after the death of the son, his wife may enter into such parcel without any other assignment, though the father be living; but this assent of the father's must be by deed, because his estate is to be charged *in futuro*, and this may likewise be of more than a third part.

The dowers *ad ostum ecclesiæ*, or *ex assensu patris*, if the wife enter and assent to them, are a good bar of her in the common law; but she may, if she will, wave them, and claim her dower at common law, because being made after marriage, she is not bound by them.

DO'WERED. *a.* (from *dower.*) Portioned; supplied with a portion (*Shakspeare*).

DO'WERLESS. *a.* (from *dower.*) Wanting a fortune; unportioned (*Shakspeare*).

DO'WLAS. *s.* A coarse kind of linen (*Shakspeare*).

DOWLATABAD, formerly called Amednagur, a province of the Deccan of Hindustan; bounded by Candeish, Malway, the Gauts, Visiapour, Golconda, and Berar.

Dowlatabad, a fortress of the Deccan of Hindustan. Lat. 19. 55 N. Lon. 76. 0 E.

DOWLE and **Deal**, in our old writers, are used to denote a division, or parting.

DOWN. *s.* (*duun*, Danish.) 1. Soft feathers (*Wotton*). 2. Any thing that soothes or mollifies (*Southern*). 3. Soft wool, or tender hair (*Prior*). 4. The soft fibres of plants which wing the seed (*Bacon*).

Down. *s.* (ꝺun, Saxon.) A large open plain; a flat on the top of a hill (*Pope*).

Down, in botany, is properly the English term for some sorts of pubescence; but it is used also for the pappus or little crown fixed on the top of some seeds, by which they fly: as dandelion, thistle, &c. This is, 1. feathered or plumose; or else, 2. capillary, hairy or simple. Some of these crowns are stiped, others sessile. Down ought not to be used in both senses. Pappus cannot well make an English substantive, though pappous may be employed as an adjective. Feather is not proper, for we cannot say, a *feathered* feather, and a *hairy* feather. Seed-down will distinguish it from pubescence. See Pappus.

Down, a county of Ireland, 42 miles long, and 34 broad, having St. George's Channel on the E. Armah on the W. Antrim on the N. and N.W. and the Ocean on the S. It sends 14 members to parliament; and is fertile, though encumbered with bogs.

Down, the capital of the above county, remarkable for the tomb of St. Patrick. Lat. 54. 29 N. Lon. 5. 42 W.

Down. *prep.* (aꝺuna, Saxon.) 1. Along a descent; from a higher place to a lower (*Shakspeare*). 2. Toward the mouth of a river (*Knolles*).

Down. *ad.* Not up. 1. On the ground (*Milton*). 2. Tending toward the ground. 3. From former to latter times. 4. Out of sight; below the horizon (*Shakspeare*). 5. To a total subjection (*Arbuthnot*). 6. Into disgrace (*South*).

Down. *interject.* 1. An exhortation to destruction or demolition (*Dryden*). 2. A contemptuous threat (*Shakspeare*).

Down. (*To go.*) To be digested; to be received (*Locke*).

To **Down.** *v. a.* (from the participle.) To knock; to subdue; to conquer (*Sidney*).

DO'WNCAST. *a.* (*down* and *cast.*) Bent down; directed to the ground (*Addison*).

DO'WNFALL. *s.* (*down* and *fall.*) 1. Ruin; fall from rank or state (*South*). 2. A body of things falling (*Dryden*). 3. Destruction of fabrics (*Dryden*).

DO'WNFALLEN. *part. a.* (*down* and *fall.*) Ruined; fallen (*Carew*).

DO'WNGYRED. *a.* (*down* and *gyre.*) Let down in circular wrinkles (*Shakspeare*).

DOWNHAM, a town of Norfolk, with a market on Saturdays. This town is famous for its butter. Lat. 52. 40 N. Lon. 0. 20 E.

DO'WNHILL. *s.* Declivity; descent (*Dryden*).

Do'wnhill. *a.* Declivous; descending (*Con.*).

DO'WNLOOKED. *a.* (*down* and *look.*) Having a dejected countenance; gloomy; sullen; melancholy (*Dryden*).

DO'WNLYING. *a.* (*down* and *lie.*) About to be in travail of childbirth.

DO'WNRIGHT. *ad.* (*down* and *right.*) 1. Straight or right down (*Hudibras*). 2. In plain terms; without ceremony (*Shakspeare*). 3. Completely; without stopping short (*Arbuthnot*).

Do'wnright. *a.* 1. Plain; open; apparent; undisguised (*Rogers*). 2. Directly tending to the point (*Ben Jonson*). 3. Unceremonious; honestly surly (*Addison*). 4. Plain; without palliation (*Brown*).

DOWNS, a bank or elevation of sand, which the sea gathers and forms along its shores; and which serves it as a barrier. The word is formed from the French *dune*, of the Celtic *dum*, a "mountain."

Downs are particularly used for a famous road for ships along the eastern coast of the county of Kent, from Dover to the North Foreland; where both the outward and homeward-bound ships frequently make some stay; and squadrons of men of war rendezvous in time of war. It affords excellent anchorage; and is defended by the castles of Deal, Dover, and Sandwich.

DO'WNSITTING. *s.* (*down* and *sit.*) Rest; repose; the act of sitting down (*Psal.*).

DOWNTON, a borough in Wiltshire, with a market on Fridays. It is governed by a mayor, and sends two members to parliament. Lat. 51. 0 N. Lon. 1. 36 W.

DO'WNWARD. **Do'wnwards.** *ad.* (ꝺuneƿeaꞃꝺ, Saxon.) 1. Toward the centre (*Newton*). 2. From a higher situation to a lower (*Milton*). 3. In a course of successive or lineal descent (*Shakspeare*).

Downward. *a.* 1. Moving on a declivity; tending toward the centre; tending to the ground (*Dryden*). 2. Declivous; bending (*Dryden*). 3. Depressed; dejected (*Sidney*).

DO'WNY. *a.* (from *down.*) 1. Covered with down or nap (*Shakspeare*). 2. Made of down or soft feathers (*Dryden*). 3. Soft; tender; soothing (*Crashaw*).

Downy-leaf, in botany. See Tomentous.

DO'WRE. **Do'wry.** *s.* (*douaire*, French. It ought to be written *dower.*) 1. A portion given with a wife (*Sidney*). 2. A reward paid for a wife (*Cowley*). See Dower.

DOXOLOGY, an appellation given by the Greeks to the fourteenth verse of the second chapter of St. Luke, *Glory be to God in the highest*, &c. because beginning with the Greek word *δοξα, glory*.

This they distinguish by the name of *great doxology*; and the *Gloria Patria, Glory be to the Father*, they call the *less doxology*, as beginning with the same word δοξα.

Philostorgius, lib. iii. n. 13. gives three formulas of the *lesser doxology*. The first is *Glory be to the Father, and to the Son, and to the Holy Ghost*; the second, *Glory be to the Father, by the Son, in the Holy Ghost*; and the third, *Glory be to the Father, in the Son, and the Holy Ghost*. Sozomen, and Nicephorus, give a fourth; viz. *Glory be to the Father, and the Son, in the holy Ghost*. The first of these *doxologies* is that in common use throughout the western church. It was first instituted about the year 350, by the Catholics of Antioch, then called *Eustathians*.

The three others were composed by the Arians: the second was that of Eunomius, and Eudoxus, and was approved by Philostorgius. The three were all made about the year 341, in the council of Antioch, when they first began to disagree among themselves.

There were anciently very great disputes, and principally at Antioch, as to the form of *doxology*; that mostly used among the orthodox was, the same as still obtains; the rest were affected by the Arians, and other Antitrinitarians; yet St. Basil, in his book on the Holy Spirit, defends the second as orthodox, and legitimate; and it is certainly more agreeable to Scripture authority; to which we must ultimately appeal, as the only infallible rule of our devotion, as well as of our conduct: and it has been urged, that no instance of the former *doxology* occurs in the New Testament.

DO'XY. *s.* (δοξα, praise or glory, used ironically.) A whore; a loose wench (*Shakspeare*).

To DOZE. *v. n.* (ꝺpæꞅ. Sax. *daes*, Dutch.) 1. To slumber: to sleep lightly (*L'Estrange*). 2. To be half asleep (*Pope*).

To Doze. *v. a.* To stupify; to dull (*Clarendon*).

DO'ZEN. *s.* (*douzaine*, French.) The number of twelve (*Raleigh*).

DO'ZINESS. *s.* Sleepiness; drowsiness (*Locke*).

DO'ZY. *a.* (from *doze.*) Sleepy; drowsy; sluggish (*Dryden*).

DRAB. *s.* (ꝺꞃabbe, Saxon, lees.) A whore; a strumpet (*Pope*).

DRA'BA. Whitlow-grass. In botany, a genus of the class tetradynamia, order siliculosa. Silicle entire, oval-oblong, with flattish valves parallel to the partition; generally style-less. Sixteen species, some leafy, others leafless in their stems; chiefly natives of the South of Europe, but three or four indigenous to our own country; of these, the most common is D. verna, found wild on old walls, with naked stalks; lanceolate, hairy, slightly serrated leaves; and cloven petals. The blossoms are white, and hang down towards the evening. It flowers very early in the spring, and is eaten by horses, sheep, and goats; not relished by cows, and refused by swine. There is a more elegant species described by Dr. Turton, under the name of D. aizoides, found by himself on the maritime rocks of Gower, with yellow flowers in a terminal raceme, petals rounded, emarginate, twice as long as the calyx; and pale green imbricate leaves.

DRABS, in the English salt-works, a name given to a sort of wooden cases, into which the salt is put as soon as it is taken out of the boiling-pan. See Salt-works.

DRACHM, a Grecian coin of the value of seven-pence three farthings. This was also the name of a kind of weight, consisting of three scruples, and each scruple of two oboli. As to the proportion that the drachm of the Greeks bore with the ounce of the Romans, Q. Remnius, in his poem of weights and measures, makes the drachm the eighth part of an ounce, not much different from the crown of the Arabiaans, which weighs something more than the drachm.

Drachm, or Dra'chma, (δραχμη, from δραττομάι, to grasp, it being about a handful; or much rather, perhaps, from the Hebrew דרכמן, drachmin.) A drachm. The eighth part of an ounce, containing three scruples or sixty grains.

DRACO, a celebrated lawgiver of Athens. When he exercised the office of archon, he made a code of laws for the use of his citizens, which, on account of their severity, were said to be written in letters of blood. By them idleness was punished with as much severity as murder, and death was denounced against the one as well as the other. Solon totally abolished these sanguinary laws, except that one which punished a murderer with death. The popularity of Draco was uncommon, but the gratitude of his admirers proved fatal to him. Once when he appeared on the theatre, he was received with repeated applause; and the people, according to the custom of the Athenians, showed their respect to their lawgiver by throwing garments upon him. This was done in such profusion, that Draco was soon hid under them, and smothered by the too great veneration of his citizens. He lived about 624 years before the Christian era.

Draco, in astronomy, *the dragon*, an old constellation of the northern hemisphere. It consists of 77 stars of the 1st six magnitudes, i. e. 0. 4. 7. 11. 23. 32.

Dra'co, in zoology, a genus of the class amphibia, order reptilia. Body four-footed, tailed and winged. One species only:

D. volans. Flying Dragon. Forelegs distinct from the wings: body ash colour, varied and clouded with brown and whitish, and covered with minute scales; gular pouch large, pointed; tail very long, annulate with whitish brown. Inhabits Africa and India: is distinguished from the lizard tribe merely by having a broad, lateral membrane, strengthened by radii or bony processes: wanders about trees, and is able, by means of the membrane, to spring from bough to bough, and support itself, for a few moments, in the air: feeds on insects. Length of the body about four inches: of the tail eight. It is in every respect a harmless and inoffensive animal, and in its very limited power of flying resembles the flying squirrel or the bat.

Linnéus has mentioned d. præpos as a second species on the authority of Seba: but Seba is the only naturalist who has seen this second species: and it is now generally conceived that what Seba thus delineated and Linnéus thus arranged is only a variety of d. volans. It may not be impertinent to adjoin that the tremendous dragons of ancient poets, and those actually figured in the works of some of the older naturalists, are mere fictitious beings, either artificially composed of the members or skins of different animals; or made by warping some particular species of the ray or skate tribe into a dragon-like shape, by expanding and drying the fins, in an elevated position, adding the legs of birds, and otherwise disguising the animal. Some of these monsters are represented by Gesner and Aldrovandus with seven hideous heads, gaping mouths, long bodies, snake-like necks and tail, and feet resembling those of birds. Linnæus himself detected a very curious imposition of this kind when at Hamburgh, the proprietor of which had the modesty to ask ten thousand florins as its price; but he was obliged to flee from the city immediately afterwards, to escape the proprietor's denounced vengeance.

For a representation of the real draco volans, see Nat. Hist. Pl. LXXVI.

DRACOCEPHALUM. Dragons-head. In botany, a genus of the class didynamia, order gymnosperma. Corol with an inflated throat, the upper lip concave; lower lip three cleft, the latter divisions erect, middle one hanging down. Eighteen species: of which some have their flowers in spikes, others in whorls; they are all indigenous, and are obtained from the Levant, Austria, or Siberia. and most of them are easily propagated by seeds in our own gardens: in which the species most frequently met with is d. Canariense, or balm of gilead: hairy at the joints; leaves soft, wrinkled, three or five together, ovate, pointed, toothed, corol flesh-colour, with white lines.

DRACONARIUS, in antiquity, *dragon-bearer*. Several nations, as the Persians, Romans, &c. bore dragons on their standards, whence the standards themselves were called dracones, and the soldiers who bore them draconarii.

DRACONIS SANGUIS. See Sanguis draconis.

DRACONTIUM. (*dracontium*, δρακοντιο; from δρακων, a dragon: so called, because its roots resemble a dragon's tail.) Dracontium sive serpentaria. Dragon's wort. In botany, a genus of the class gynandria, order polyandria. Spathe boot-shaped, spadix covered, calyxle; petals five, berries many seeded. Five species: all natives of the East or West Indies. The only species much cultivated among ourselves is D. pertusum, with climbing stalks, and leaves pierced with holes; it easily runs up trees or walls to the height of thirty feet. the flowers are terminal, of a pale whitish yellow. It is easily propagated by cuttings, which should be planted in pots filled with poor sandy earth, and plunged into a hot-bed. Its roots and leaves are extremely acrimonious, more so than the arum maculatum, with which it agrees in medicinal virtues.

DRACUNCULUS. (dim. of *draco*, a dragon.) A species of dragon-wort. Also a worm in Guinea, so called because it is supposed to be poisonous; and produces in the inhabitants of that country a disease of the skin, named *vena medinensis*. The Guinea-worm. See Filaria.

DRAFF. *s.* (ꝺꞃoꝼ, Saxon; *draf*, Dutch.) Refuse; lees; dregs (*Ben Jonson*).

DRA'FFY. *a.* (from *draff*.) Worthless; dreggy.

DRAFT. *a.* (corrupt for *draught*.) Employed to draw, as oxen (*Shakspeare*).

To DRAG. *v. a.* (ꝺꞃaᵹan, Saxon.) 1. To pull along the ground by main force (*Swift*). 2. To draw any thing burdensome (*Smith*). 3. To draw contemptuously along (*Stillingfleet*). 4. To pull about with violence (*Clarendon*). 5. To pull roughly and forcibly (*Dryden*).

To Drag. *v. n.* To hang so low as to trail or grate upon the ground (*Moxon*).

Drag. *s.* (from the verb.) 1. A net drawn along the bottom of the water (*Rogers*). 2. An instrument with hooks to catch hold of things under water (*Walton*). 3. A kind of car drawn by the hand (*Moxon*).

Drag, is a term in hunting, and used exactly in the same sense in regard to the fox, as trail is in regard to the hare. Upon throwing the hounds into covert to draw for a fox, any single hound giving tongue, is said to challenge, and to have hit upon drag; that is, to have come upon the foot or scent of the fox, where he had been in the night or early part of the morning, before he retired to secrete himself for the day. When it was the custom to be at the covert side as soon as there was day-light sufficient to ride up to the hounds, drag was speedily obtained; and in many instances a good drag proved better than a bad chase: but in the present fashion of going to cover, and throwing off at mid-day, drag is but very little known, and but of trifling use if found; for the scent must, from the great length of intervening time, have so generally died away, that no expectation can be entertained of the hounds carrying it up to the game.

Drag-net. See Net.

DRAGACANTHA. See Tragacantha.

DRAGANT GUM. See Tragacantha.

To DRA'GGLE. *v. a.* (from *drag*.) To make dirty by dragging on the ground (*Gay*).

To Dra'ggle. *v. n.* To grow dirty by being drawn along the ground (*Hudibras*).

DRAGOMAN, or Drogman, a term of general use through the east, for an interpreter, whose office is to facilitate commerce between the orientals and occidentals. These are kept by the ambassadors of Christian nations residing at the Porte, for this purpose.

DRAGON, in astronomy. See Draco.

Dragonflying, in amphibiology. See Draco.

Dragon-fly, in entomology. See Libellula.

Dragon-beams, in building, two struts which stand under a brest-summer, and meet on the shoulder of the king-piece.

DRAGONS. See Dracontium, and Arum.

Dragon's blood. See Sanguis draconis.

Dragon's-head, in botany. See Dracocephalum.

Dragon's-head, and tail, in astronomy, are the nodes of the planets, but more particularly of the moon, being the points in which the ecliptic is intersected by her orbit, in an angle of about 5° 18′. One of these points looks northward, the moon beginning then to have north latitude; and the other southward, where she commences south latitude; the former point being represented by the knot ☊ for the head and the other by the same reversed, or ☋ for the tail. And near these points it is that all eclipses of the sun and moon happen. See MOON.

DRAGON-SNAP, in botany. See ANTIRRHINUM

DRAGON-TREE. See DRACŒNA.

DRAGONET, in ichthyology. See CALLIONYMUS.

DRA'GONISH. *a.* (from *dragon.*) Having the form of a dragon (*Shakspeare*).

DRA'GONLIKE. *a.* Furious; fiery (*Shakspeare*).

DRA'GONSBLOOD. *s.* A resin, so named as to seem to have been imagined an animal production (*Hill*).

DRAGO'ON. *s.* (from *dragen*, Ger. to carry) A kind of soldier that serves indifferently either on foot or horseback (*Tatler*).

To DRAGO'ON. *v. a.* To persecute by abandoning a place to the rage of soldiers (*Prior*).

To DRAIN. *v. a.* (*droiner*, French.) 1. To draw off gradually (*Bacon*). 2. To empty, by drawing gradually away what it contains (*Roscommon*). 3. To make quite dry (*Swift*).

DRAIN. *s.* (from the verb.) The channel through which liquors are gradually drawn; a watercourse; a sink (*Mortimer*).

DRAINING, in agriculture, is the art or practice of making artificial channels, for carrying off superfluous moisture or water from wet or marshy lands.

This highly useful art did not generally engage the attention of agriculturists till about the middle of last century. It was formerly practised by persons, called *undertakers*, who received one-third of the drained land as a recompense. The advantages to be derived from their labours being obvious, several public-spirited men of talent have lately, with considerable success, investigated the subject; and with great exertions, not only rendered the most boggy and unfruitful soils firm and stable, but, in many instances, so much improved their fertility as to be productive of the finest grain.

Lands to be drained are usually divided into two classes: 1. *Uplands*, or those which are situated so high, that the water can descend from them, if properly collected and conducted; and, 2. *Fens*, *marshes*, or those lands which lie so low as to command no fall; have no descent; and some being even below the level of the sea.

1. With regard to *uplands*, it generally happens that the waters from the springs beneath the soil are obstructed in their course to the neighbouring rivers. These springs originate from the atmospheric moisture; which, being condensed on the summits of hills into water, by the greater coldness of those parts, perforates the different strata of the incumbent soil, where it is of a porous nature; the water continues to descend, sometimes for many miles together, but generally from the nearest eminences into the adjoining valley, till its course is intercepted by a stratum of clay; where, being collected in considerable quantities, it is forced to work itself a passage through the porous strata of sand, gravel, or rock, that may be above the clay, following the course of these strata, till they approach the surface of the earth, or are interrupted by any obstacle, which causes the water to rise to the surface, and to form springs, bogs, marshes, &c.

At the foot of hills, therefore, where the plain begins to be too moist, some augur-holes should be bored, in order to find the depth of the springs, and consequently the thickness of the upper stratum of the soil. If this be only 4 or 6 feet, an horizontal ditch should be cut along the bottom of the hill, to intercept the water, which ought to be carried off by one or more ditches communicating with the former, and conducting the water thus collected into the neighbouring rivulet. Farther, as the strata, through which the water descends in forming these springs, have, with a few exceptions, the same inclination as the surface of the hill, the holes should be bored, and the ditch cut, not vertically downwards, as is commonly practised, but perpendicularly to that surface; a method which greatly facilitates the arriving at the second stratum.

If, nevertheless, on cutting a ditch five or six feet deep, along the foot of a hill, vertically to the rising plain, the upper stratum be not penetrated, and consequently no water ooze in to the bottom of the ditch, it will be expedient to bore other holes at the bed of such ditch, some yards deeper, or till water ascend through them. Where this succeeds, many holes should be made, and the water conducted into the adjacent brook, or river; for it will then rise, collect in those trenches six feet below the wet surface of the valley, and thus be carried off, instead of rising up from the lower wall-springs, or apertures of the stratum, through the incumbent soil, to the surface of the valley, which is so many feet higher.

This is the method which has been successfully practised, for several years, by Mr. Elkington; but the prior, or at least coeval, discovery of which, is justly claimed by Dr. James Anderson, who states (in the introduction to his ingenious Essays on Agriculture, vol. iii.) that he sunk a hole with a wimble into the earth at the bottom of a ditch, in the year 1764; that the water rose six feet above the surface of the ground, and has continued flowing ever since, though with less rapidity.

These ditches should be made narrower as they descend, by spades of a proportionate size and breadth: but the lowest part ought to be contracted more than any other, so that the shoulders or edges of it may support stones or faggots, in order to cover the whole, at a small expence, without obstructing the currents of water. In many places, hollow-bricks, ridge-tiles, or old fragments of plastered floors, may be applied to the same purpose; as they may be substituted for stones, or faggots, and at a reduced expence.

Situations, however, frequently occur, where the first stratum of the earth may be too thick to be easily perforated; or where the water, condensed from the atmosphere on the summits of the hills, may work itself a passage between the second and third, or between the third and fourth strata, which form the sides of those hills, from a deficiency of so many of the strata at their summits. Hence the water lies too deep to be reached in its progress by a ditch, or by boring; but, being dammed up by the materials that form the plain of the valley, it ascends through them to the surface, and thus forms boggy or marshy ground. In such cases, the common mode of draining may be successfully employed: it consists in cutting several ditches four or six feet across the bog, or morass, and in covering them so that the water may not be obstructed in its passage, but be thus in part collected and conveyed away, though certainly with less advantage than where springs can be intercepted.

Another method of draining is, that of opening trenches, or drains, almost annually, by a large plough with two converging coulters, and other appropriate machinery, for the purpose of cutting both sides of a ditch at the same time, and turning out the intervening soil. These large ploughs are still kept in some parishes, and drawn over moist commons, by twelve or twenty horses, so as to form parallel ditches.

An instrument was invented for this purpose by Mr. Adam Scott, of Guildford, Surrey, called by him a mole-plough, and for which the Society for the Encouragement of Arts, &c. in 1797, gave him a bounty of thirty guineas. It consists of a coulter, 15 inches in length, and 2½ in width, to cut the sward. Behind this is applied an horizontal cone of cast iron, 20 inches long, and 2½ in diameter at the base, to the middle of which is fixed an upright bar 2 feet long, and 3½ inches broad, with a sharp edge. If this cone be drawn along moist lands, 6 or 8 inches beneath the turf, either in the spring or in autumn, in several parallel directions, the water will be conveyed away for a considerable space of time, without breaking the surface. With Mr. Scott's mole-plough, a man and boy with four horses may, with ease, drain thirty acres in a day; but, at the lower side of the ground intended to be drained, there should be an open gripe or ditch, in order to receive the water from those small cavities which are formed by the plough, at the depth of 12 or 14 inches. In very moist lands, or in very wet seasons, if a larger number than six or eight horses be employed, their feet will not sink so deeply into the turf, as each animal will draw less; should, however, the ground be so exceedingly soft as scarcely to support the cattle, that inconvenience may be obviated by fixing to the horses' feet broad wooden shoes, similar to the snow shoes made use of by the inhabitants of northern climates. The price of this useful plough, when complete, does not exceed two guineas and a half.

The last method of draining uplands, of which we shall give an account, is that practised in the county of Berks. It consists in digging a trench 2 feet deep, one foot wide at the top, and 9 inches at the bottom, with a steep descent to a ditch, extending along the bottom of the grounds, and made of a proper width and depth, to receive and carry off the water. Within these trenches is formed a channel, the sides of which are composed of hard white chalk, cut nearly into the size of bricks; the whole is covered with pieces of the same material, and the crevices filled up with the chippings. The mouth of the channel, where the water falls into the ditch, is constructed with brick or flint, as chalk will not bear the frost, to which this part of the work must necessarily be exposed. On the top of the channel is placed a thin coat of wheat-straw, brambles, or any small brush-wood. The passage for the water will be somewhat more than 3 inches. In digging trenches of this kind, the workmen lay the best earth on one side by itself, in order to replace it on the surface, when the trenches are again filled up. But, in all cases, where land lies on a declivity, care should be taken that the drains have an easy and gentle descent; for, if they have too rapid a fall, they are apt to burst, or excavate; and, their protection below being lost, the least pressure from above will consequently destroy the work.

II. With respect to the draining of those plains or morasses where no fall can be procured, the water may, in many situations, be collected by cutting a long horizontal ditch above the level of the morass, so as to intercept all the wall-springs; and may then be carried off in wooden troughs, or hollow bricks, above the surface; and, if any water continue to penetrate the morass, it may be conducted to the extremity of the ground, either in open drains or in covered brick drains

The draining of low moist lands may also be advantageously effected by a roller or wheel. This is made of cast-iron, weighs 4 cwt and is 4 feet in diameter: the cutting edge or extreme circumference of the wheel is half an inch thick, which, increasing in thickness towards the nave or centre, will cut a drain half an inch in width at the bottom, 4 inches wide at the top, and about 15 inches deep. This wheel is so placed in a frame that it may be loaded at pleasure, in order to score out a greater or less depth, according to the resistance of the ground; which being thus cut during the winter, the wheel-tracks are either then filled with straw ropes, and lightly covered over, or left to crack wider and deeper, during the succeeding summer; when the fissures should be kept open with twisted straw and bushes, and lightly covered with such porous soil as can be most conveniently procured. Thus hollow drains may be formed upon grass or ley-land, at little expence, and will answer every useful purpose.

The necessity and utility of draining the surface-water from clay soils, in wet seasons, is generally acknowledged; but, excellent as the different methods are in the cases before mentioned, they do not appear to be so simple, or so effectual, as could be wished in the present. Covered drains frequently fail in producing the desired effect, in consequence of the covering material being of too close a texture to admit the water to filtrate through them with sufficient freedom. Mole-ploughs, of the best construction, require such a number of horses to draw them, as must necessarily injure the soil, by poaching it. Farther, covered drains are not only dangerous to full-grown sheep and young lambs, but from the quantity of clay necessarily dug up, and spread over the richer surface-soil, they are also injurious to vegetation. None of the several modes of draining now in use being subservient to the essential purpose of conducting large quantities of water from a deep soil, we feel satisfaction in communicating the following simple contrivance of Mr. John Middleton, published in the 22d No. of the Commercial and Agricultural Magazine. It consists merely in adding a piece of wood to the felly of a common six-inch cart-wheel, to which is prefixed a rim of iron, of a triangular form. The whole expence of this addition does not exceed one guinea. A wheel of this description, when put on the axle of a cart in the usual way, will of course rest on the edge of the triangular rim of iron above alluded to; and, on driving the horses forward, will make a small indent in the ground, merely by its own revolution. But, in order to press it down to the depth of six or eight inches, that side of the cart should be laden with stones, iron, or any other heavy material, until the whole of the rim, as well as the additional piece of wood, and the felly itself, if necessary, sink into the soil. The cart should then be drawn in such a direction that the cutting-wheel may revolve where the drains are intended to be formed. Sometimes it will be necessary to apply the indenting machine to every furrow; but, where the land is level, it should be drawn over it in parallel lines, five or ten yards apart. The wheel on the opposite end of the axle is a common six-inch wheel, which supports only the empty side of the cart, and consequently will not cut the ground.

The advantage of this contrivance, as stated by Mr. Middleton, is, that it makes an indent in the soil sufficient to carry off the water during the ensuing winter, by pressing down the herbage, without destroying it. In the succeeding spring, these drains will be nearly grown up, so that there is no injury done to the grass. He observes, however, that this wheel should be drawn over the ground every year, on the approach of winter; but so easy is its application, that by means of it, and two old horses, one stout boy, or man, may drain from ten to twenty acres in eight hours.

The first object in draining a bog or marsh, is, to discover the lowest spot of dry ground that surrounds it, in order to open on that part the main trench which is to carry off the water: if there be the least appearance of any stream, it should be traced with care; for this will point out the proper spot on which to begin. The main trench, commencing at the lowest part, may be carried to whatever distance it is thought proper: if it begin at the right spot, 10 acres may be detached from the marsh, however extensive, and completely drained; but, if the drainage be not begun where there is a sufficient fall, the labour bestowed will be to no purpose: the main cut or trench should be 10 feet broad in the clear, with a proper slope, to prevent the sides from falling in, and filling it up.

Bogs are divided into two sorts, black and red. The former are solid, and make excellent fuel for common fires, or for burning lime; but the red bog consists of a loose, porous, fungous mass, which burns badly, and yields no ashes. Hence, in black bogs only, the drains ought to be cut into turfs, dried, carted, and piled.

As the main canal advances, small ones may be conducted into it on either side, inclosing such spots of ground as are intended to be improved. No certain rule can be laid down for the depth of drains; yet we apprehend the prevailing practice of cutting them down to the solid ground beneath the bog, is founded on the erroneous principle, that such depth is sufficient as will leave the surface dry. Numerous drains, however, being always useful and necessary, the spots inclosed ought not to contain more than five acres; but in such space it is requisite that several cross-cuts be made, which should be 4 feet broad at the top, and 3 feet deep. A whole year will be requisite to complete these drains; and, in the ensuing spring, it will be necessary to open, deepen, and clear them of the adventitious boggy matter; a work which should be occasionally renewed. The second year may be employed in extending the main trench; in taking in fresh inclosures by new lateral cuts; and in draining these by means of small transverse drains. Although this annual deepening and clearing of marshy grounds be attended with great labour and expence, yet the operation is thus progressively completed, and in succeeding years both trouble and costs will be gradually diminished, in proportion as the bog subsides.

As soon as the drains have rendered the marshes sufficiently firm for oxen to walk on them, the heaviest rollers that can be procured should be employed, to act by repeated pressure. Indeed, without a considerable degree of such pressure, during the first year, no bog can be effectually consolidated. An alternate draining and rolling, annually (the drains being still kept open), would, probably, contribute much to the destruction of weeds. Previous to rolling in the spring, it has been strongly recommended to sow every kind of grass seeds, indiscriminately, such as ray-grass, hay-seed, clover, &c.

Stone drains are calculated for soils where the common methods of draining cannot be adopted. Such drains ought to be cut 10 or 12 inches wide, with perpendicular sides; and flat stones should be so placed, as to leave a water-course at the bottom, by setting two stones triangularly to meet at the points. Or, the bottom may be covered with a flat stone, and three others placed upright, and the water left to work itself a passage between them. In either case, the cavity of the drain ought to be filled nearly up to the top with loose stones: screened or washed gravel, where it is found in greater abundance, has been successfully substituted. Those pebbles, however, which are often found on the sea-shores, are well adapted for filling drains; as, being smooth, and generally round, the water flows through them more freely.

The principal drains ought to be 3 feet deep, and 18 inches in width; the bottom and top should be laid with flag-stones; the sides built up to a sufficient height with common stones; and the whole covered with sods of turf, but the grassy sides downwards: these again are to be overspread with earth, sufficient to admit the plough. The smaller drains are, in general, to be conducted at an acute angle into the main trenches.

Sod or earth-drains are usually dug two feet deep with a spade, when the soil is taken out by an instrument, or scoop, about four inches wide, and the drain covered with the sods first dug out, if the ground be firm enough to support them; or, some black-thorns are put in, in order to bear the weight of the sods. Those drains which have the smallest passage for the water at the bottom are reputed to be the most durable: as the force of the water has been found sufficient to clear away any small obstacles accidentally obstructing its course.

The following sketch of the drainage and improvement of a marsh, near Marazion in Cornwall, describing a peculiar mode of taking off the water, and securing the land from the overflowing of the sea, by Mr. Richard Moyle, of Marazion, is taken from the Communications to the Board of Agriculture.

A piece of land called the marsh, or bog, near Marazion in Cornwall, containing thirty-six statute acres, has, from time immemorial, been covered with two or three feet of water, and which, at spring-tides, was overflowed with the sea, by means of a river which passed through the land. This ground looks towards the south, and is separated from the sea by a long skirting of sand of about seventeen acres, over which the turnpike road passes towards Penzance, on its most elevated part: on the north of the marsh lies some croft ground (i. e. higher and not subject to inundations), which gradually rises as it retires from the bog, so that the marsh is surrounded on the north and south by elevated spots; and the water on its surface usually crept away to the sea by means of a river, through which the water at high spring-tides always had access. From the depressed situation of this marsh, it was impossible to take off all the surface water through the river, and recourse was had, for this purpose, to a square wooden pipe of nine inches diameter, which was introduced at that part of the shore called half-ebb, and which was eight feet lower than the surface of the marsh. This pipe was introduced through the sandy soil, in some places twenty-four feet deep, till it arrived at the south part of the bog, where it was found to be six feet under the surface. At this place a reservoir of eighteen feet square, and eight feet deep, was immediately cut out; and the water draining from the marsh, during the time the tide was in, was received in the reservoir, and discharged when the tide was out through the pipe with great velocity. The sea, at high water, covers this pipe with nine or ten feet of water: a long trench, of three feet deep and five wide, was extended from this place, east and west, on the south side of the bog, for its whole length, bordering on the sandy soil; and at the distance of every sixty yards, a similar trench was cut up directly north towards the croft, which divided the whole marsh into oblong square fields. By the means of these trenches, or open drains, the whole surface water was conveyed directly to the reservoir, and thence to the sea. The pipe at both its extremities was guarded with valves, which shut at the approach of the tide; and during its flowing, the water accumulated about two or two and a half feet high in the reservoir; and as the sea retires, the collected water runs off without any interruption, till the next return of the tide: the pipe is covered with the sea six hours in every twelve. This singular mode of drainage answers uncommonly well, and has never once failed in five years: the extremities of the pipe have also iron bars placed before them, to prevent the intrusion of extraneous bodies. As soon as the surface water was removed, a strong embankment of turf was made on the south and east sides, to prevent the overflowing of the tides; and the water, which formerly diffused itself over the whole of this ground, was collected into a river, and carried to the sea on the outside of this embankment. In cutting the open drains, a pot of copper coins, containing about a thousand, was discovered three feet under the surface, and which appeared to belong to the emperor Victorinus, who reigned in the third century. These coins were much injured by the corrosion of the salt water, but several were still perfect enough to trace the outlines of the emperor. As soon as the evaporation had assisted the consolidation of the surface, the air, within a mile of the marsh, became so strongly impregnated with a sulphureous smell, as to render the place quite noxious to passengers.

On examining the different strata, we found that two feet and a half of the surface consisted of mud and a peaty substance, most strongly interwoven with the roots of goss (arundo phragmites) and common rushes, which were the only substance that grew spontaneously on its surface; below this, was a stratum of three feet and a half of pure peat, of a very inflammable nature, and which seems to have extended over twenty acres of the marsh: under the peat lay a bed of sand, from four to six feet deep; from which we may conjecture that the whole was formerly an arm of the sea, and that the dropping of vegetables, and deposition of mud (which possibly formed the peat), had gradually expelled the sea, except at spring-tides. This stratum of sand does not appear to be the original bed of the sea; for, on streaming for tin, another floor from six to ten feet deeper was discovered, consisting of round smooth pebbles, and gravelly substances, containing tin; among which were willow trees and hazel nuts, in the most perfect state.

The mode of improvement adopted was the following: The surface was pared and burned; and after repeated ploughings, &c. for two years, large bodies of clay, with manure, were then carried on its surface, and a slight crop of white oats with ever-grass (ray), common and Dutch clover, sown in the spring. The saltness of this ground was so very powerful for the first three years, as to destroy every crop; on the fourth, the land began to vegetate partially; but on the fifth, or present year, 1798, every part seems to be quite alive; so that every kind of vegetable now flourishes with great luxuriancy. It has afforded this summer very good crops of hay, and an abundant and rich pasture, with a prospect of improvement the next season. The expences of draining this ground, with trenching, paring, ploughing, burning, and manuring it, with the failure of three years crops, amount to a very considerable sum; and this distressing circumstance is increased, on its being only a leasehold for three lives.

The sandy land has been partly inclosed, and covered with large bodies of clay and manure; it has afforded remarkably fine crops of turnips, and the grass of this season has been very luxuriant. The crofty land on the north (twenty-two acres) has been all cultivated, first with potatoes, and afterwards sown with wheat, barley, oats, and turnips, and produced very good crops.

The whole of this improved ground has been productive of considerable advantages to the public, particularly to the poor. Four hundred persons yearly receive turf from it; two hundred and fifty are fed most plentifully with potatoes, which are planted here by very poor people, who are, in consequence of having land given them, become uncommonly industrious; and the whole neighbourhood, by its drainage, have got rid of low nervous fevers and agues, with which it was continually pestered.

The whole ground under improvement consists of seventy-five acres, of which thirty-six are marsh, twenty-two croft, and seventeen of sand. In 1798, forty acres were under different crops; viz. wheat two acres and a half, barley nine, oats eight, turnips two, potatoes five, hay and pasture thirteen and a half.

On the sides of every open trench is planted a row of quicksets, interspersed with a few planes and pinasters. These are defended from the cattle and blights by means of a temporary turf hedge, and promise to afford a pleasing division of the land in a few years. To every inclosure of the marsh a part of the rising ground of the croft is annexed to accommodate cattle in wet seasons.

In the year 1798 this land was visited and examined on the spot as to the facts, by sir John Call, and the above particulars given him by the proprietor.

We shall conclude this article with an account of the effect of a luxuriant weed, called by botanists the equisetum palustre, upon drains. Sir Joseph Banks, in a letter to the secretary of the Board of Agriculture, communicates the following particulars:

"Few objects of agricultural utility," says the baronet, "have ever interested me so much, and I have no hesitation in saying that none are, in my opinion, so interesting to the increasing prosperity of the landed interest of this kingdom, as the theory of draining whole districts, by tapping the mother springs that overflow their surface, and conducting drains through the principal valleys, so contrived as not only to render the boggy parts of them sound land, but also to free the sides of the hills which form them from all outbursts of water.

"Mr. Elkington is certainly the father of this system of drainage, but Mr. Farey has perfectly comprehended all the works done by that gentleman for the duke of Bedford, and in the mode of conducting the operations now carrying on, has, in some instances, excelled them, founding his practice on an extensive and enlightened theory, applicable to all valley bogs, in the drainage of which, it appears to me almost impossible that his method should fail, under any circumstances.

"One thing, however, has occurred, in the short experience of the Woburn operations (about five years), which appears to me of consequence enough to warrant the trouble this will give to you and the Board. Some bogs, drained by under drains made at a great expence through the most miry parts of them, appeared at first perfectly dry, but have since been found to grow by degrees less and less so. On examination, these drains have been found more or less choked up by a plant vegetating within them, and forming both stems and roots, the whole several yards in length, intercepting the course of the water, weakening the current by degrees, and at last wholly choking up the drain.

"This plant is the equisetum palustre, a weed common in moorish and swampy places, but hitherto little noticed by naturalists; its root, or rather its stem under ground, is a yard or more in length, and in size like packthread; from this, a root of twice the size of the stem runs horizontally in the ground, taking its origin from a lower root, which strikes downwards perpendicularly to a depth I have not hitherto been able to trace, as thick as a small finger; this perpendicular root forms in some places beds, which occupy a large portion of the more solid part of a peaty bog, as may be seen in some parts of the banks of the duke's open drains.

"As the bud by which the plant appears to renew itself in the spring is situated on the horizontal root, a yard or more in depth, the shoot must, in its progress upwards, be liable to meet with under drains, and penetrate into them through the openings left for the passage of the water. When once entered, nature, which has given to the plant the power of piercing the soil upwards from a great depth, enables it to live in the confined atmosphere of a drain, where, as it is continually drawn forward by the current, the joints lengthen themselves beyond their natural dimensions; hence it is probable that when drains choked with it are taken up and carefully examined, the length of the plants will be found very much to exceed those I have observed."

The author hopes that this will lead to further discussion, and to the discovery of a remedy for this evil, which seems likely to put a stop to the practice of draining bogs, where this mischievous plant grows, by under drains. It is necessary for the evil to be known, in order that those who possess bogs that have become miry after being drained, may be apprised of an evil which can certainly be cured by the simple expedient of casting the under drains into open ones.

Common earth-drains are sometimes dug two or three spits deep, with a broad spade, the bottom is taken out with a narrow one, and filled with stones. Sometimes a furrow is drawn with a plough, and cleared by a common spade: the draining instrument is then introduced to the depth of 18 inches from the surface; afterwards taking out the loose mold with a scoop.

Hollow drains, without stones, have been tried on stiff lands: they are made narrow at the bottom, and covered half way up with sods, or square pieces of the surface-sward, resting on ledges cut for that purpose.

It is much to be lamented, that we possess, in this cold climate, no grain similar to rice, that would grow in watery grounds which cannot be drained, nor indeed any esculent roots or foliage, except water-cresses. In such situations, some plants may perhaps be cultivated with profit to the proprietor, as the festuca fluitans, or floating fescue; callitriche, or star-grass, or star-wort; to which may be added the orchis, for the purpose of making salep, by drying the peeled roots in an oven. If these plants should not completely succeed, other vegetables of quick growth may be raised for manures, such as the typha, or cat's-tail; the caltha, or marsh-marigold, &c.; which should be mown twice a-year, while they are young, and abound with saccharine and mucilaginous matter, ready to pass into fermentation, (*Willich, English Ency, &c.*).

DRAKE. *s.* (of uncertain etymology.) 1. The male of the duck (*Mortimer*). 2. A small piece of artillery (*Clarendon*).

Drake (Francis), a celebrated English commander. He was born at Tavistock, in Devonshire, 1545, and went to sea with his relation sir John Hawkins. In 1570, he went to the West Indies with two ships; and in 1572 he made another expedition, which proved very successful. He next served under Walter, earl of Essex, in Ireland, where he distinguished himself so much by his bravery, that sir Christopher Hatton introduced him to queen Elizabeth, who granted him her protection, for it must be allowed that Drake was little better than a freebooter. In 1577 he made another voyage to the Spanish settlements in America, and sailed as far as to 48 degrees N. latitude, calling the country which he discovered New Albion. He then went to the East Indies, and having doubled the Cape of Good Hope, returned to Plymouth, Nov. 3, 1580; so that this voyage round the world took up two years and nearly ten months. His fame was now great; queen Elizabeth went on board his ship, and after dinner conferred on him the honour of knighthood. In 1585 he sailed again for the West Indies, where he took several places from the Spaniards, and returned laden with wealth. In 1587, he commanded a fleet of 30 sail, with which he entered Cadiz, and destroyed above 10,000 tons of shipping, which he called "burning the king of Spain's beard." The year following, he commanded as vice-admiral under lord Howard, and was highly instrumental in the destruction of the Spanish armada. After this he went to the West Indies with sir John Hawkins, but the two commanders disagreeing in their plans, little was done by them. Drake died on board of his ship off Nombre de Dios, in 1596. He was representative for the town of Plymouth, to which he had been a great benefactor, in causing water to be conveyed to it from springs at eight miles distance.

DRAKENA. See CONTRAYERVA.

DRAM. *s.* (from *drachm.*) 1. In weight the eighth part of an ounce (*Bacon*). See DRACHM. 2. A small quantity (*Dryden*). 3. Such a quantity of distilled spirits as is usually drank at once (*Swift*). 4. Spirit; distilled liquor (*Pope*).

To DRAM. *v. n.* To drink distilled spirits.

DRAMA, a poem containing some certain action, and representing a true picture of human life, for the delight and improvement of mankind. The principal species of the drama are two, comedy and tragedy. Some others there are of less note, as pastoral, satire, tragicomedy, opera, &c.

DRAMATIC, an epithet given to that which is not narrative, but represented by action on the stage.

The successful dramatic writer, says Dr. Cogan, catches the ideas and imitates the language of every passion, emotion, and affection, in their different stages and degrees. His professed object is to suppose a diversity of characters, and to support them with a correspondent train of ideas; to inspire them with predilections and aversions, or call forth particular passions and affections, according to the situations in which he has placed them. His hopes of success depend upon the closeness of the imitation; and success itself consists in being able to interest the heart, by exciting affections and emotions similar to those which would be felt by the reader or spectator, were he an immediate witness to similar scenes in real life . . . . . The complete actor possesses the happy talent of expressing by manner the state of mind represented by the author. He adopts what modern orators reject, and attempts to give force to pertinent ideas and language by imitative tones, gestures, and countenance, which he varies according to the versatile state of those who are tossed upon the billows of passion, or agitated by some contending emotions, or under the more permanent influence of particular affections . . . . In theatrical exhibitions there is a conspiracy to delude the imagination; and all the powers of sympathy are called forth to produce the effect. Correspondent scenery points out to the spectator the very spot of action, and characteristic dresses exert their influence to aid the deception. The spectator leaves every idea of real life at the door of entrance, and voluntarily yields himself up to the pleasing delusion. He finds himself in a new world. He is transported in an instant into distant regions and remote ages, and feels in fiction all the force of truth. He laughs at mimic folly, sincerely weeps at artificial misery, is inspired with horror and indignation at imaginary baseness, and is in an ecstasy of joy at counterfeit happiness. (*Cogan on the Passions*, p. 269.)

The subjects of the drama are either the light and the gay, or the grave and affecting incidents of human life. The former constitute the subject of comedy, and the latter of tragedy.

As great and serious objects command more attention than little and ludicrous ones; as the fall of a hero interests the public more than the marriage of a private person; tragedy has been always held a more dignified entertainment than comedy. The first thing required of the tragic poet is, that he pitch upon some moving and interesting story, and that he conduct it in a natural and probable manner. For we must observe, that the natural and probable are more essential to tragic than even to epic poetry. Admiration is excited by the wonderful; but passion can be raised only by the impressions of nature and truth upon the mind.

The subject best fitted for tragedy is where a man has himself been the cause of his misfortune; not so as to be deeply guilty, nor altogether innocent: the misfortune must be occasioned by a fault incident to human nature, and therefore in some degree venial. Such misfortunes call forth the social affections, and warmly interest the spectator. An accidental misfortune, if not extremely singular, doth not greatly move our pity: the person who suffers, being innocent, is freed from the greatest of all torments, that anguish of mind which is occasioned by remorse. An atrocious criminal, on the other hand, who brings misfortunes upon himself, excites little pity, for a different reason: his remorse, it is true, aggravates his distress, and swells the first emotions of pity; but then our hatred of him as a criminal blending with pity, blunts its edge considerably. Misfortunes that are not innocent, nor highly criminal, partake the advantages of each extreme: they are attended with remorse to embitter the distress, which raises our pity to a great height; and the slight indignation we have at a venial fault detracts not sensibly from our pity. The happiest of all subjects accordingly for raising pity, is where a man of integrity falls into a great misfortune by doing an action that is innocent, but which, by some singular means, is conceived by him to be criminal: his remorse aggravates his distress; and our compassion, unrestrained by indignation, knows no bounds. Pity comes thus to be the ruling passion of a pathetic tragedy; and, by proper representation, may be raised to a height scarce exceeded by any thing felt in real life. A moral tragedy takes in a larger field; as it not only exercises our pity, but raises another passion, which, though selfish, deserves to be cherished equally with the social affection. The passion we have in view is fear or terror; for, when a misfortune is the consequence of some wrong bias in the temper, every spectator who is conscious of such a bias in himself takes the alarm, and dreads his falling into the same misfortune: and by the emotion of fear or terror, frequently reiterated in a variety of moral tragedies, the spectators are put upon their guard against the disorders of passion.

The commentators upon Aristotle, and other critics, have been much puzzled about the account given of tragedy by that author: "That by means of pity and terror, it refines or purifies in us all sorts of passion." But no one who has a clear conception of the end and effects of a good tragedy, can have any difficulty about Aristotle's meaning: our pity is engaged for the persons represented; and our terror is upon our own account. Pity indeed is here made to stand for all the sympathetic emotions, because of these it is the capital. There can be no doubt, that our sympathetic emotions are refined or improved by daily exercise; and in what manner our other passions are refined by terror, has just now been said. One thing is certain, that no other meaning can justly be given to the foregoing doctrine than that now mentioned; and that it was really Aristotle's meaning, appears from his thirteenth chapter, where he delivers several propositions conformable to the doctrine as here explained. These, at the same time, we take the liberty to mention; because, so far as authority can go, they confirm the foregoing reasoning about subjects proper for tragedy. The first proposition is, that it being the province of tragedy to excite pity and terror, an innocent person falling into adversity ought never to be the subject. This proposition is a necessary consequence of his doctrine as explained: a subject of that nature may indeed excite pity and terror; but the former in an inferior degree, and the latter in no degree for moral instruction. The second proposition is, that the history of a wicked person in a change from misery to happiness, ought not to be represented; which excites neither terror nor compassion, nor is agreeable in any respect. The third is, that the misfortunes of a wicked person ought not to be represented: such representation may be agreeable in some measure upon a principle of justice; but it will not move our pity; nor any degree of terror, except in those of the same vicious disposition with the person represented. The last proposition is, that the only character fit for representation lies in the middle, neither eminently good, nor eminently bad; where the misfortune is not the effect of deliberate vice, but of some involuntary fault, as our author expresses it. The only objection we find to Aristotle's account of tragedy, is, that he confines it within too narrow bounds, by refusing admittance to the pathetic kind: for, if terror be essential to tragedy, no representation deserves that name but the moral kind, where the misfortunes exhibited are caused by a wrong balance of mind, or some disorder in the internal constitution: such misfortunes always suggest moral instruction; and by such misfortunes only can terror be excited for our improvement.

Thus, Aristotle's four propositions above-mentioned relate solely to tragedies of the moral kind. Those of the pathetic kind are not confined within so narrow limits: subjects fitted for the theatre are not in such plenty as to make us reject innocent misfortunes which excite our sympathy, though they inculcate no moral. With respect indeed to the subjects of that kind, it may be doubted, whether the conclusion ought not always to be fortunate. Where a person of integrity is represented as suffering to the end under misfortunes purely accidental, we depart discontented, and with some obscure sense of injustice: for seldom is man so submissive to Providence, as not to revolt against the tyranny and vexations of blind chance; he will be tempted to say, This ought not to be. We give for an example the Romeo and Juliet of Shakspeare, where the fatal catastrophe is occasioned by friar Laurence's coming to the momument a minute too late; we are vexed at the unlucky chance, and go away dissatisfied. Such impressions, which ought not to be cherished, are a sufficient reason for excluding stories of this kind from the theatre.

Besides tragedy, dramatic poetry comprehends comedy and farce. These are sufficiently distinguished from tragedy by their general spirit and strain. While pity and terror, and the other strong passions, form the province of the tragic muse, the chief instrument of comedy and farce is ridicule. These two species of composition are so perpetually running into each other, that we shall not treat of them separately; it is true that what is now known by the name of farce, is too much inclined to extravagance of ridicule; but the most commendable specimens of this kind of entertainment differ in nothing essential from proper comedy. "Comedy," says Blair, "proposes for its object neither the great sufferings, nor the great crimes of men; but their follies and slighter vices, those parts of their character which raise in beholders a sense of impropriety, which expose them to be censured and laughed at by others, or which render them troublesome in civil society.

"The subjects of tragedy are not limited to any age or country; but the scene and subject of comedy should always be laid in our own country, and in our own times. The reason is obvious; those decorums of behaviour, those lesser discriminations of character, which afford subject for comedy, change with the differences of countries and times; and can never be so well understood by foreigners as by natives. The comic poet, who aims at correcting improprieties and follies of behaviour, should 'catch the manners living as they rise.' It is not his business to amuse us with a tale of other times; but to give us pictures taken from among ourselves; to satirize reigning and present vices; to exhibit to the age a faithful copy of itself, with its humours, its follies, and its extravagancies.

"Comedy may be divided into two kinds: comedy of character, and comedy of intrigue. The former is the more valuable species; because it is the business of comedy to exhibit the prevailing manners which mark the character of the age in which the scene is laid: yet there should be always as much intrigue as to give us something to wish and something to fear. The incidents should so succeed one another, as to produce striking situations, and to fix our attention; while they afford at the same time a proper field for the exhibition of character. The action in comedy, though it demands the poet's care in order to render it animated and natural, is a less significant and important part of the performance than the action in tragedy: as in comedy it is what men say, and how they behave, that draws our attention, rather than what they perform or what they suffer.

"In the management of characters, one of the most common faults of comic writers is the carrying of them too far beyond life. Wherever ridicule is concerned, it is indeed extremely difficult to hit the precise point where true wit ends and buffoonery begins. When the miser in Plautus, searching the person whom he suspects of having stolen his casket, after examining first his right hand and then his left, cries out, *Ostende etiam tertiam*—'Show me your third hand,' there is no one but must be sensible of the extravagance. Certain degrees of exaggeration are allowed to the comedian, but there are limits set to it by nature and good taste; and supposing the miser to be ever so much engrossed by his jealousy and his suspicions, it is impossible to conceive any man in his wits suspecting another of having more than two hands."

It appears from the plays of Aristophanes, which remain, that the characters in the old comedy of Athens were almost always overcharged. They were likewise directed and avowed satires against particular persons, who were brought upon the stage by name. "The ridicule employed in them is extravagant, the wit for the most part buffoonish and farcical, the raillery biting and cruel, and the obscenity that reigns in them is gross and intolerable. They seem to have been composed merely for the mob." Yet of these abominable dramas, Hurd has affirmed, with too much truth, that what is now called farce is nothing more than the shadow. The characters in genuine comedy are not those of particular and known persons, but the general characters of the age and nation; which it requires no small skill to distinguish clearly and naturally from each other. In attempting this, poets are too apt to contrast characters and introduce them always in pairs; which gives an affected air to the whole piece. The perfection of art is to conceal art. A masterly writer will give us his characters distinguished rather by such shades of diversity as are commonly found in society, than marked with such strong oppositions as are rarely brought into actual contrast in any of the circumstances of real life.

The style of comedy ought to be pure, elegant, and lively, very seldom rising higher than the ordinary tone of polite conversation; and upon no occasion descending into vulgar, mean, and gross expressions; and, in one word, action and character being the fundamental parts of every epic and dramatic composition, the sentiments and tone of language ought to be subservient to these, so as to appear natural and proper for the occasion.

Dramatic compositions have some peculiarities, which it will be proper to mention. The first is a double plot: one of which must resemble an episode in an epic poem; for it would distract the spectator, instead of entertaining him, if he were forced to attend at the same time to two capital plots equally interesting. And even supposing it an under-plot like an episode, it seldom hath a good effect in tragedy, of which simplicity is a chief property; for an interesting subject that engages our affections occupies our whole attention, and leaves no room for any separate concern. Variety is more tolerable in comedy; which pretends only to amuse, without totally occupying the mind. But even there, to make a double plot agreeable, is no slight effort of art: the under-plot ought not to vary greatly in its tone from the principal; for discordant emotions are unpleasant when jumbled together; which, by the way, is an insuperable objection to tragi-comedy. Upon that account the Provoked Husband deserves censure; all the scenes that bring the family of the Wrongheads into action, being ludicrous and farcical, are in a very different tone from the principal scenes, displaying severe and bitter expostulations between lord Townley and his lady. The same objection touches not the double plot of the Careless Husband; the different subjects being sweetly connected, and having only so much variety as to resemble shades of colours harmoniously mixed. But this is not all. The under-plot ought to be connected with that which is principal, so much at least as to employ the same persons: the under-plot ought to occupy the intervals or pauses of the principal action; and both ought to be concluded together. This is the case of the Merry Wives of Windsor.

Violent action ought never to be represented on the stage. While the dialogue goes on, a thousand particulars concur to delude us into an impression of reality; genuine sentiments, passionate language, and persuasive gesture: the spectator, once engaged, is willing to be deceived, loses sight of himself, and without scruple enjoys the spectacle as a reality. From this absent state he is roused by violent action; he wakes as from a pleasing dream; and, gathering his senses about him, finds all to be a fiction. Horace delivers the same rule; and founds it upon the same reason:

> Ne pueros coram populo Medea trucidet;
> Aut humana palam coquat exta nefarius Atreus;
> Aut in avem Progne vertatur, Cadmus in anguem:
> Quodcunque ostendis mihi sic, incredulus odi.

The French critics join with Horace in excluding blood from the stage; but, overlooking the most substantial objection, they urge only that it is barbarous and shocking to a polite audience. The Greeks had no notion of such delicacy, or rather effeminacy; witness the murder of Clytemnestra by her son Orestes, passing behind the scene, as represented by Sophocles: her voice is heard calling out for mercy, bitter expostulations on his part, loud shrieks upon her being stabbed, and then a deep silence. An appeal may be made to every person of feeling, whether this scene be not more horrible than if the deed had been committed in sight of the spectators upon a sudden gust of passion. If Corneille, in representing the affair between Horatius and his sister, upon which the murder ensues behind the scene, had no other view than to remove from the spectators a shocking action, he was guilty of a capital mistake: for murder in cold blood, which in some measure was the case as represented, is more shocking to a polite audience, even where the conclusive stab is not seen, than the same act performed in their presence by violent and unpremeditated passion, as suddenly repented of as committed. Addison's observation is just; that no part of this incident ought to have been represented, but reserved for a narrative, with every alleviating circumstance in favour of the hero.

A few words upon the dialogue, which ought to be so conducted as to be a true representation of nature. We talk not here of the sentiments nor of the language; but of what properly belongs to dialogue-writing; where every single speech, short or long, ought to arise from what is said by the former speaker, and furnish matter for what comes after till the end of the scene. In this view, all the speeches from first to last represent so many links of one regular chain. No author, ancient or modern, possesses the art of dialogue equal to Shakspeare. Dryden, in that particular, may justly be placed as his opposite. He frequently introduces three or four persons speaking upon the same subject, each throwing out his own notions separately, without regarding what is said by the rest: take for an example the first scene of Aurengzebe. Sometimes he makes a number club in relating an event, not to a stranger supposed ignorant of it, but to one another, for the sake merely of speaking: of which notable sort of dialogue we have a specimen in the first scene of the first part of the Conquest of Granada. In the second part of the same tragedy, scene second, the king, Abenamar, and Zulema, make their separate observations, like so many soliloquies, upon the fluctuating temper of the mob: a dialogue so uncouth puts one in mind of two shepherds in a pastoral excited by a prize to pronounce verses alternately, each in praise of his own mistress.

This manner of dialogue-writing, beside an unnatural air, has another bad effect: it stays the course of the action, because it is not productive of any consequence. In Congreve's comedies, the action is often suspended to make way for a play of wit.

No fault is more common among writers than to prolong a speech after the impatience of the person to whom it is addressed ought to prompt him or her to break in. Consider only how the impatient actor is to behave in the mean time. To express his impatience in violent action without interrupting would be unnatural; and yet to dissemble his impatience, by appearing cool where he ought to be highly inflamed, would be no less so.

Rhyme being unnatural and disgustful in dialogue, is happily banished from our theatre: the only wonder is that it ever found admittance, especially among a people accustomed to the more manly freedom of Shakspeare's dialogue. By banishing rhyme, we have gained so much as never once to dream that there can be any future improvement. And yet, however suitable blank verse may be to elevated characters and warm passions, it must appear improper and affected in the mouths of the lower sort. Why then should it be a rule, that every scene in tragedy must be in blank verse? Shakspeare, with great judgment, has followed a different rule; which is, to intermix prose with verse, and only to employ the latter where it is required by the importance or dignity of the subject. Familiar thoughts and ordinary facts ought to be expressed in plain language: to hear, for example, a footman deliver a simple message in blank verse, must appear ridiculous to every one who is not biassed by custom. In short, that variety of characters and of situations, which is the life of a play, requires not only a suitable variety in the sentiments, but also in the diction.

In the drama, as well as in poetry in general, great stress is generally laid upon what are called the three unities, viz. the unity of action, that of time, and that of place. The unity of the dramatic action consists in the unity of the intrigue, in comedy, and that of the danger, in tragedy; and this not only in the plan of the fable, but in the fable extended and filled with episodes. This unity of action is of great consequence; but less so with the moderns, whose dramatic exhibitions admit of so much extraneous assistance, than with the ancients. On the Greek stage, so great was their regard to this unity, that they suffered not the action and representation to be interrupted: the division by acts was totally unknown. The word act never once occurs in Aristotle's Poetics, in which he defines exactly every part of the drama, and divides it into the beginning, the middle, and the end. At certain intervals, indeed, the actors retired; but the stage was not then left empty, nor the curtain let fall; for the chorus continued and sung. Neither do these songs of the chorus divide the Greek tragedies into five portions, similar to our acts; though some of the commentators have endeavoured to force them into this office. But it is plain, that the intervals at which the chorus sung are extremely unequal and irregular, suited to the occasion and the subject; and would divide the play sometimes into three, sometimes into seven or eight acts.

As practice has now established a different plan on the modern stage, has divided every play into five acts, and made a total pause in the representation at the end of each act, the question to be considered is, whether the plan of the ancient or of the modern drama is best qualified for making a deep impression on the mind? That the preference is due to the plan of the modern drama, will be evident from the following considerations. If it be indeed true, as the advocates for the three unities allege, that the audience is deluded into the belief of the reality of a well-acted tragedy, it is certain that this delusion cannot be long supported; for, when the spirits are exhausted by close attention, and by the agitation of passion, an uneasiness ensues, which never fails to banish the waking dream. Now, supposing the time that a man can employ with strict attention without wandering to be no greater than is requisite for a single act (a supposition that cannot be far from truth), it follows, that a continued representation of longer duration than an act, instead of giving scope to fluctuation and swelling of passion, would overstrain the attention, and produce a total absence of mind. In this respect, the four pauses have a fine effect: for, by affording to the audience a seasonable respite when the impression of reality is gone, and while nothing material is in agitation, they relieve the mind from its fatigue; and consequently prevent a wandering of thought at the very time possibly of the most interesting scenes.

In one article, indeed, the Grecian model has greatly the advantage: its chorus, during an interval, not only preserves alive the impressions made upon the audience, but also prepares their hearts finely for new impressions. In our theatres, on the contrary, the audience, at the end of every act, being left to trifle time away, lose every warm impression; and they begin the next act cool and unconcerned, as at the commencement of the representation. This is a gross malady in our theatrical representations; but a malady that luckily is not incurable: to revive the Grecian chorus, would be to revive the Grecian slavery of place and time; but we can figure a detached chorus coinciding with a pause in the representation, as the ancient chorus did with a pause in the principal action. What objection, for example, can there lie against music between the acts, vocal and instrumental, adapted to the subject? Such detached chorus, without putting us under any limitation of time or place, would recruit the spirits, and would preserve entire the tone, if not the tide, of passion: the music, after an act, should commence in the tone of the preceding passion, and be gradually varied till it accord with the tone of the passion that is to succeed in the next act. The music and the representation would both of them be gainers by their conjunction; which will thus appear. Music that accords with the present tone of mind is, on that account, doubly agreeable; and, accordingly, though music singly hath not power to raise a passion, it tends greatly to support a passion already raised. Further, music prepares us for the passion that follows, by making cheerful, tender, melancholy, or animated impressions, as the subject requires. Take for an example the first scene of the Mourning Bride, where soft music, in a melancholy strain, prepares us for Almeria's deep distress. In this manner, music and representation support each other delightfully: the impression made upon the audience by the representation, is a fine preparation for the music that succeeds; and the impression made by the music is a fine preparation for the representation that succeeds. It appears evident, that by some such contrivance the modern drama may be improved, so as to enjoy the advantage of the ancient chorus without its slavish limitation of place and time.

In the drama, the unities of time and place are readily allowed to be of less consequence than that of action: the poet, however, ought not to indulge in an unrestrained latitude in these respects: for instance, nothing can be more absurd than at the close to exhibit a full-grown person who appears a child at the beginning: the mind rejects, as contrary to all probability, such latitude of time as is requisite for a change so remarkable. The greatest change from place to place hath not altogether the same bad effect: in the bulk of human affairs place is not material; and the mind, when occupied with an interesting event, is little regardful of minute circumstances: these may be varied at will, because they scarce make any impression.

Our great poet Shakspeare, it is well known, paid no regard to the unities of time and place; and Dr. Johnson is of opinion that a nearer view of the principles on which they stand will diminish their value, and withdraw from them the veneration which, from the time of Corneille, they have very generally received, by discovering that they have given more trouble to the poet, than pleasure to the auditor. We shall present the ingenious argumentation of this great man in his own language.

"The necessity of observing the unities of time and place, arises from the supposed necessity of making the drama credible. The critics hold it impossible, that an action of months or years can be possibly believed to pass in three hours; or that the spectator can suppose himself to sit in the theatre, while ambassadors go and return between distant kings, while armies are levied, and towns besieged, while an exile wanders and returns, or till he whom they saw courting his mistress, should lament the untimely fall of his son. The mind revolts from evident falsehood, and fiction loses its force when it departs from the resemblance of reality.

"From the narrow limitation of time necessarily arises the contraction of place. The spectator, who knows that he saw the first act at Alexandria, cannot suppose that he sees the next at Rome, at a distance to which not the dragons of Medea could, in so short a time, have transported him; he knows with certainty that he has not changed his place, and he knows that place cannot change itself; that what was a house cannot become a plain; that what was Thebes can never be Persepolis.

"Such is the triumphant language with which a critic exults over the miseries of an irregular poet, and exults commonly without resistance or reply. It is time, therefore, to tell him, by the authority of Shakspeare, that he assumes as an unquestionable principle a position, which, while his breath is forming it into words, his understanding pronounces to be false. It is false, that any representation is mistaken for reality; that any dramatic fable, in its materiality, was ever credible, or, for a single moment, was ever credited.

"The objection arising from the impossibility of passing the first hour at Alexandria, and the next at Rome, supposes, that when the play opens, the spectator really imagines himself at Alexandria; and believes that his walk to the theatre has been a voyage to Egypt, and that he lives in the days of Antony and Cleopatra. Surely he that imagines this may imagine more. He that can take the stage at one time for the palace of the Ptolemies, may take it in half an hour for the promontory of Actium. Delusion, if delusion be admitted, has no certain limitation; if the spectator can once be persuaded that his old acquaintance are Alexander and Cæsar, that a room illuminated with candles is the plain of Pharsalia, or the bank of Granicus, he is in a state of elevation above the reach of reason, or of truth, and from the heights of empyrean poetry, may despise the circumspections of terrestrial nature. There is no reason why a mind thus wandering in ecstasy should count the clock; or why an hour should not be a century in that calenture of the brain, that can make the stage a field.

"The truth is, that the (judicious) spectators are always in their senses, and know, from the first act to the last, that the stage is only a stage, and that the players are only players. They come to hear a certain number of lines recited with just gesture and elegant modulation. The lines relate to some action, and an action must be in some place; but the different actions that complete a story may be in places very remote from each other; and where is the absurdity of allowing that space to represent first Athens, and then Sicily, which was always known to be neither Sicily nor Athens, but a modern theatre?

"By supposition, as place is introduced, time may be extended; the time required by the fable elapses for the most part between the acts; for, of so much of the action as is represented, the real and the poetical duration is the same. If, in the first act, preparations for war against Mithridates are represented to be made in Rome, the event of the war may, without absurdity, be represented, in the catastrophe, as happening in Pontus; we know that there is neither war, nor preparation for war; we know, that we are neither in Rome nor Pontus; that neither Mithridates nor Lucullus are before us. The drama exhibits successive imitations of successive actions; and why may not the second imitation represent an action that happened years after the first, if it be so connected with it, that nothing but time can be supposed to intervene? Time is, of all modes of existence, most obsequious to the imagination; a lapse of years is as easily conceived as a passage of hours.

In contemplation we easily contract the time of real actions, and therefore willingly permit it to be contracted when we only see their imitation.

"It will be asked how the drama moves, if it is not credited? It is credited with all credit due to a drama. It is credited, whenever it moves, as a just picture of a real original; as representing to the auditor what he would himself feel, if he were to do or suffer what is there feigned to be suffered or to be done. The reflection that strikes the heart is not that the evils before us are real evils, but that they are evils to which we ourselves may be exposed. If there be any fallacy, it is not that we fancy the players, but that we fancy ourselves unhappy for a moment; but we rather lament the possibility, than suppose the presence of misery, as a mother weeps over her babe, when she remembers that death may take it from her. The delight of tragedy proceeds from our consciousness of fiction; if we thought murders and treasons real, they would please no more.

"Imitations produce pain or pleasure, not because they are mistaken for realities, but because they bring realities to mind. When the imagination is recreated by a painted landscape, the trees are not supposed capable to give us shade, or the fountains coolness; but we consider how we should be pleased with such fountains playing beside us, and such woods waving over us. We are agitated in reading the history of Henry V. yet no man takes the book for the field of Agincourt. A dramatic exhibition is a book recited with concomitants that increase or diminish its effect. Familiar comedy is often more powerful on the theatre than in the page; imperial tragedy is always less. The humour of Petruchio may be heightened by grimace; but what voice or what gesture can hope to add dignity or force to the soliloquy of Cato?

"A play read affects the mind like a play acted. It is therefore evident, that the action is not supposed to be real, and it follows, that between the acts a shorter or longer time may be allowed to pass, and that no more account of space or duration is to be taken by the auditor of a drama, than by the reader of the narrative, before whom may pass in an hour the life of a hero, or the revolutions of an empire."

Dr. Johnson concludes his remarks on this topic, with the following passage: "He that, without diminution of any other excellence, shall preserve all the unities unbroken, deserves the like applause with the architect, who shall display all the orders of architecture in a citadel, without any deduction from its strength: but the principal beauty of a citadel is to exclude the enemy; and the greatest graces of a play are to copy nature, and instruct life." (*Preface to Shakspeare*).

To these observations we will add nothing, but leave them to make their full impression on the mind of the reader.

DRAMA'TICALLY. *ad.* Representatively; by representation.

DRA'MATIST. *s.* (from *drama.*) The author of dramatic compositions (*Burnet*).

DRANK. The preterit of *drink*.

Drank, a name given by farmers to the great wild oat.

To **DRAPE.** *v. n.* (*drap*, French.) To make cloth (*Bacon*).

DRA'PER. *s.* (from *drape.*) One who sells cloth.

DRA'PERY. *s.* (*drapperie*, Fr.) 1. Clothwork; the trade of making cloth; woollen manufacture (*Bacon*). 2. Cloth; stuffs of wool (*Arbuthnot*). 3. The dress of a picture (*Prior*).

DRA'PET. *s.* (from *drape.*) Cloth; coverlet: not in use (*Spenser*).

DRASTICS. (*drastica, medicamenta*, δραστικος, active, brisk; from δραω, to effect.) Medicines which are very violent in their action on the whole or some part of the intestinal canal, as drastic purges, drastic emetics, &c.

DRAVE. The preterit of *drive*.

Drave, a considerable river of Germany, which rises in the Tyrol, runs across Carinthia, and entering Stiria, continues its course to Marpurg; then it runs along the confines of Sclavonia and Lower Hungary, passing by Esseck, and a little after falls into the Danube.

DRAUGH. *s.* (corruptly written for *draff.*) Refuse; swill (*Shakspeare*).

DRAUGHT. *s.* (from *draw.*) 1. The act of drinking (*Swift*). 2. A quantity of liquor drank at once (*Boyle*). 3. Liquor drank at pleasure (*Milton*). 4. The act of drawing or pulling carriages (*Temple*). 5. The quality of being drawn (*Mortimer*). 6. Representation by picture (*Dryden*). 7. Delineation; sketch; outline (*Locke*). 8. A picture drawn (*South*). 9. The act of sweeping with a net (*Hale*). 10. The quantity of fishes taken by once drawing the net (*L'Estrange*). 11. The act of shooting with a bow (*Camden*). 12. Diversion in war; the act of disturbing the main design (*Spenser*). 13. Forces drawn off from the main army; a detachment (*Addison*) 14. A sink; a drain (*Matthew*). 15. The depth which a vessel draws, or sinks into the water (*Dryden*). 16. (In the plural, *draughts.*) A kind of play resembling chess. 17. A bill of exchange; or an order for the payment of any sum of money due.

Draught, (or, as it is pronounced, *draft.*) In architecture, the figure of an intended building described on paper; wherein are laid down the several divisions and partitions of the apartments, rooms, doors, passages, &c. in their due proportion. See Design.

Draught-horse, in farming, a sort of coarse-made horse, destined for the service of the cart or plough. On the choice of these, see the article Cart-horse.

Nothing is so essential to the health of these serviceable creatures as cleanliness; if they are fed ever so well, and not kept clean, they will be subject to numerous diseases.

The servant who has the care of them ought to be up very early, and to clean the racks and mangers from all filth. The currying of them ought to be carefully performed every morning; but not in the stable, for the dust to fall upon the other horses, as it is too often done. After the horses are dusted, the groom should daily twist a whisp of straw hard up, and, wetting it in water, rub the legs, shoulders, and body, with it. Many of the diseases of draught-horses, which are not owing to uncleanliness, are owing to bad water; such as is too raw, too muddy, or too cold, being all improper. If there be any running stream in the neighbourhood, they should always be taken to that to water every day in summer; but in winter, well-water, being warmer, is better for them. If there be a necessity of giving them well-water in summer, it must be drawn up some hours before the time, and exposed to the sun-beams in tubs or troughs; marsh-water, or that of low-land ditches, is worst of all. When the labouring horse has drank his water, he should have his oats given him, and these should be carefully sifted, and the manger dusted first. It is a common practice, as soon as a horse is come in from his work, to rub down his legs with a whisp of hay; but some (we think without any good reason) have objected to it.

While a horse is in a sweat, it is a great relief and refreshment to him to have his body rubbed down. The rack is to be well supplied with hay, and the horse should be left to rest and eat about two hours, and then led to water: after this his oats should be given him, and he should then go to work again.

In the evening when the labour of the day is over, the first thing to be done is to examine the feet, and see if any thing is amiss about the shoes; and what earth or gravel is lodged in the foot, between the shoe and the sole, is to be picked out, and some fresh cow-dung put in its place, which will cool and refresh the part.

A very material thing for the preservation of all sorts of cattle, but of none so much as of draught-horses, is fresh and clean litter. This is a thing too often neglected in the care of these creatures; and many even neglect the cleaning away the old litter on purpose, leaving it there to imbibe more moisture, that it may be the better manure for the land. It is true, that by this the dung is enriched, and will go farther; but the benefit they reap from it is nothing in comparison with the mischief they do the horse in the mean time; for the heat this gives his feet is alone enough to hurt him. The owner often finds the effect of this, without knowing the cause; the horse, if his hoof be naturally soft and flat, becomes tender-footed and weakly, and is unable to do his business, though fed in the best manner that can be: the dung in this case is left under him, that there may be some advantage from his feeding; and the mischief is increased, instead of being relieved, till in the end the horse is generally rendered useless.

DRAUGHT OXEN. Oxen employed for the purpose of draught of any kind instead of horses; an employment which, though considerably cultivated by several of our most intelligent farmers, has by no means met with so general an introduction as on a great variety of accounts it deserves. Mr. Culley employs a hundred and fifty draught oxen in his husbandry, and has continued to employ them to a very great, though not an equal extent, for upwards of thirty years; he uses them single in carts, and pairs them in his ploughs with reins and no driver: and his advice is, not to mix oxen with horses, on account of the inequality of their steps.

Thus it is not a matter of speculation, but of experience and proof, that all the labour of husbandry may be well performed by oxen; and surely, if the only objection, that of their being somewhat slower than horses, can never be surmounted, there are other considerations of weight sufficient to overbalance it. A greater number of them may be kept to forward labour, and that, instead of being an extra charge (as would be the case with an extra number of horses) to both individual and public emolument. The balance in favour of individuals must be indeed great, if we reflect that three oxen may be purchased for less money than one good cart-horse; that the latter is liable to be worn out, and to become of little or no worth, whereas the former never wear out, but the last stage of their useful lives is as profitable as the first.

The method proposed by most people, desirous of effecting this advantageous change in our agricultural economy, is by the interference of government, either by the way of restrictive taxation, or absolute prohibition; means which ought never to be resorted to in any such case. There is, however, a species of coercion perfectly legitimate, that of the lord of the land over his tenant; and Mr. Culley submits it to public-spirited landlords, whether, in granting leases, it would not be an act of public duty, to stipulate for the employment of draught oxen upon their farms to a certain extent. Such a clause would be an advantageous change for the impolitic one of compelling the tenant to make summer fallows.

But it will be asked of those who are sanguine in recommending the use of bullocks for labour, to point out where such may be had, and that with little trouble too; for it is well known to those most conversant with his character, that the husbandman will not be induced to step a single inch out of his accustomed track by a prospect of the greatest advantage; nay, will even regard the man with a kind of hatred, who should presume to point it out to him. The oxen broken for draught are few; and in numberless situations, particularly out of breeding counties, a man must send five or six score miles to obtain them. This inconvenience must be obviated by the body of landlords, and by our great experimental stock-breeders; on whom it depends to raise an improved species, in sufficient numbers for general use, and to divulge the best methods of breaking and training them to labour. The old-fashioned wooden yoke has been long laid aside, and experience shews that oxen draw best in breast collars; indeed their harness differs very little from that of the horse, and any collar-maker can very easily furnish them.

The improvement having obtained thus far in the field of husbandry, and having surmounted its greatest difficulty, it is scarce possible but it must even, by contagion, reach the other departments of public service. Stage waggons are not required to move quick; and if we must give up a few hours in a journey, surely both the proprietors and the public would be amply recompensed for a little lost time, by the exchange of wholesome beef for unprofitable carrion. Teams of oxen were set up years ago in this service, which did not succeed, but were again exchanged for horses; but little stress will be laid upon this by persons versed in the uncertain nature of experiments. The species of cattle might be improper, and we have reason to suspect they were not kept in sufficient good condition. The expected improvement in carriages, from the multiplication of wheels, may possibly have the additional good effect of promoting the use of oxen. All persons concerned in carriages will do well to attend to what Mr. James has said upon the subject.

With respect to the brewery, upon a small scale, or in the country, all the business of draught required in such a situation may be equally well performed by oxen as by horses: a considerable improvement of that concern; since their bullocks, after having worked a sufficient time, might be fattened with their own grains.

How far oxen might be useful in the hurry and bustle of a London porter-brewery, those concerned must be the most proper judges; and there can be no doubt that those gentlemen would be ready enough to catch at any considerable alleviation of the immense expence of horse-keeping, the annual amount of which in a great house is a noble revenue.

Often has it been wished it were possible to extripate the whole race of those Belgic locusts, the heavy cart-horses, and to divide the duties of slow-draft between polled oxen and cast off machiners. It would be an act of mercy, and securing a kind of retreat for these last, particularly when employed upon a farm; for which reason, we should wish to see them a somewhat wider and squarer race. After all these fine speculations, we fear we must have a few Suffolk punches, to draw us through, when deeply set in heavy roads.

Mr. Lawrence observes that, an ox-team ploughs an acre in eight hours, performing the day's work with full as much ease and dispatch as a team of horses. The oxen are exceedingly handy, and may be driven with a heavy load to a hair's breadth. His informant is in the habit of carting lime from the distance of seventeen miles, both with ox and horse teams; and the former usually beat the horses by about an hour in the journey, taking the carts faster up the hills. Oxen, by trial, have walked more miles in a given time than cart-horses. The former are fed with hay and chaff, and but little corn is required for them.

The neat cattle, both of Herefordshire and Shropshire, are a superior species in respect to form as well as size: the latter have the preference for the dairy; the former are reared to great size and beauty, by the judicious and spirited breeders of that county, and annually command extraordinary prices, as grazing stock, in Buckingham and Oxfordshire. In Herefordshire they put their bullocks to work at two years old, continuing them until five or six; but as, during the late excessive prices of stock, every resource has been anticipated, working oxen have been commonly sold to go to keep, at three and four years old. The price of a young bullock, fit to break for harness, before the war, was from ten to seventeen pounds, since which it has been more than doubled. Indeed the price of live stock of all kinds has been high of late, and was, on the commencement of the year 1797, so exorbitant, as scarce to seem deserving of credit; now the price is in some degree moderated.

The ox being an animal of a meek and gentle spirit, and easily intimidated, it is highly necessary to use the utmost mildness and forbearance in breaking him in to labour, and indeed in driving him ever afterwards; a rash and mad-headed driver will soon spoil the tempers, and lower the worth, of the best team of bullocks. They are apt to conceive attachments and antipathies, and to take alarm at persons who have treated them ill. On first beginning to plough with oxen, it is advisable to engage a driver who is their countryman, and has been accustomed to attend the species.

In Sussex, the use of oxen for the plough is general, and they perform well upon the stiffest clays of that country; it has even been asserted, that they hang better to the collar, in a long day, than horses. The Sussex beasts are slower than the Hereford. Some farmers have put their bulls to work with advantage.

Now if accounts be to be relied on, there are oxen to be found nearly, if not altogether, upon a par with horses, both at plough and on the hard road, notwithstanding no improvement in the breed, for that express purpose, has ever been attempted; and it has never yet been the custom to feed them well, or to aim at getting them in high condition, as we do horses. On that account it probably is, that bullocks are sometimes so dull and faint, and liable to such dangerous accidents, from being over fatigued at work.

In Holland they keep their cows curried as fine as racers, and body-clothe them upon turning them out. Our labouring beasts ought to be kept within doors in winter, fed with corn, and dressed as carefully as horses.

The fair question is, does an additional annual product of corn throughout the island result from the labour of horses, sufficient to reimburse their superior expence, and to counterbalance the profit of slaughtering the oxen, after their period of labour shall have expired? We should suppose the negative of the proposition most probable, and that we are merely sacrificing to our prejudices, and to the venerable idol custom, in using such multitude of draught horses. Of the further possible improvement of the breed of oxen, in point of activity, Mr. Lawrence does not hesitate to speak with confidence; yet he candidly acknowledges, that the farmers of Essex assert the superiority of horses, and even the almost impossibility of making any tolerable shift with oxen; at the same time he believes none of them have ever made the experiment. But in Hampshire, a considerable farmer, keeping an equal number of horses and of oxen for the plough, found little or no difference in their services. In Northumberland, Mr. Cully, after thirty years experience, keeps one hundred and fifty draught oxen, using them two in a plough, with reins and no driver, and in carts, singly. In Middlesex, an ox team of the slowest kind, having little or perhaps no corn, ploughed three quarters of an acre per day, where the horse-team did an acre. These bullocks also carted hay to London, returning as usual with dung. In Herefordshire, the oxen, with very little corn, beat the horses both at plough and upon the roads, which are very hilly and stony. In Sussex, oxen are used at plough with the greatest success. In many parts of the west of England, oxen are preferred to horses for both kinds of labour.

From these data every one is at liberty to draw his inferences; but let it be considered, that the number of horses employed in agriculture, and for the different purposes of slow draught, in Britain, probably exceeds one million five hundred thousand, and that if only one half of these could with propriety be changed into good wholesome beef, how immense must be the saving; it being taken into the account, that the time approaches, with fearful strides, when national economy alone can save us from impending destruction. In two respects, we may perhaps pretend to some little originality of thinking on this subject; to wit, on the more liberal feeding, and the breeding the ox to greater speed. Every one who has entered into the philosophy of laborious exertion, and attended the practice, whether in men or animals, must be convinced how much it depends upon ample and solid nutriment. Every adept in the mysteries of the stable well knows how contributory are cleanliness, and keeping the perspiration open and free, by regular diurnal frictions, to the nimbleness and hilarity of the animal. In regard to raising a variety of the ox, with the qualification of more than the usual activity, where should be the difficulty, since we have been long accustomed to vary and mould him at pleasure into such differing shapes and forms as caprice or interest has prompted? Perhaps those gentlemen who have been in the habits of breeding horses for the turf would succeed best in this pursuit: it is of great national importance, and not unworthy attention.

Mr. Arthur Young, in the Annals of Agriculture, after stating, that the labouring ox, with proper management, gains two or three pounds per year, whilst the horse grows annually worse, observes, "that the ox requires no oats, and, instead of hay, is generally contented with straw." This, however, Mr. Lawrence suspects, may have a tendency rather to retard, than forward, the public object of employing oxen. For the grand objection to bullocks for labour being the want of expedition, he thinks this can never be obtained from any animals, without solid and generous keep.

Masgal, farrier to James I. observes, that oxen were generally used and esteemed superior to horses, for the plough, in his days; he mentions disorders brought upon working oxen by poor keep, and their being subject in consequence to lie down in the furrow, when they were with difficulty got up again: he recommends for them, barley in the straw, which will, he says, keep them lusty and strong; also to curry them like horses, and constantly wash their feet and claws. It was the custom in those days to work barreners. The ancients occasionally purged their labouring oxen.

Mr. Young speaks of a hornless breed of Devons, of a red colour, near Bridport. To this place recourse may be easily had by a curious breeder. In breeding the ox for labour, the required points are, clean and fine head and neck, deep shoulder, wide quarters, thin skin, silk coat; and those qualities must be sought among the Herefords, Yorkshire short-horns, North Devons, and those of Sussex. There are exceeding fast walkers amongst the Yorkshire cows; and some well formed for labour, which appeared to be bred between Norman or Alderney stock, and Yorkshire. Equal activity of exertion at dead pulls, or ability to lift great weights, with our best cart-horses, must never be expected in the most improved breed of oxen; at the same time it must be conceded, those qualities are not our material objects of pursuit.

DRAUGHT-HOOKS, are large hooks of iron fixed on the cheeks of a cannon-carriage, two on each side, one near the trunnion-hole, and the other at the train, and are called the fore and hind draught-hooks.

DRAU'GHTHOUSE. *s.* (*draught* and *house.*) A house in which filth is deposited (*Kings*).

DRAUGHTS. (*jeu aux dames*, Fr.) A well known game played with counters, upon a quadrilateral board, containing sixty-four checks. Neither the origin of the word, nor the history of the game, has hitherto been attempted by any of our lexicographers or antiquaries, if we except Skinner; who explains the word draughts as follows: "*Ludus latrunculorum simplicior; nobis sic dictum credo à verbo* to draw, *quia scilicet latrunculi victi hinc, inde rapiuntur et auferentur.*" "The simpler game of table-men; thus denominated among ourselves, as I suppose, from the verb *to draw*; because the table-men here overpowered, are drawn off, and carried away."

There are various sources, however, as it appears to us, from which the word draughts may be more readily derived. Johnson offers no derivation, but in one of his meanings of the word draught explains it to denote "Forces drawn off from the main body; a detachment;" and in another, "Diversion in war; the act of disturbing the main design; perhaps sudden attack."

Now all these apply strictly to the nature of the game, and offer a directer origin than that suggested by Skinner. Yet the real origin, if we mistake not, is the following.

A draught is a sketch, design, or picture; a draught-board is a sketch or picture-board; in the present instance, the board containing the sketch or picture on which the pieces that play the game are to move, and which are on this account called themselves the draughts, draught-men, or occupiers of the draught-board.

Of the history we are totally ignorant. Every one, however, who attends to its general scope and operations, will readily perceive that it is a mere modification of the simpler movements and operations of chess; and consequently that it must have been invented some time after the latter game became known in Europe. The board, on which the game is played, is directly a chess-board, containing the same number of squares. The counters, or men, as they are called at draughts, are the pawns, paons, or footmen, as they are called at chess; in both games these pieces make a similar advance, and are only able to move from one square to another at a time, without any retrograde movement whatever; and in both also they can only take prisoners, by moving in a diagonal direction. There is this difference, however, that in chess the pawns move straight forward when they do not take prisoners, and only in an oblique line when they do; while in the easier game of draughts this complex motion is simplified, and the pawns never move otherwise than in an oblique line.

The great and characteristic difficulty of chess, consists in the diversity of the movements allowed to the pieces called the king and his officers. These pieces, therefore, are entirely laid aside in the game of draughts, which is played by twelve pawns or men alone on each side. The latter game, however, as well as the former, has its kingly dignity, which is the only titled dignity it retains from the parent source. In the European chess, which is derived immediately from the Persians, we allow but one king on each side; in the Hindustanee chess, however, there are two kings, as well as two queens, and two officers of every kind. In draughts, the kings are capable of multiplication, to a much greater extent on either side: and instead of being hereditary as in chess, they are advanced, in draughts, from the common ranks, and acquire the regal dignity alone by their own courage and success; for every pawn or man that is capable of pushing forward, and taking possession of a post in the extreme or hindmost line of squares belonging to the hostile party, is immediately crowned, and capable of moving in any diagonal direction whatever, backwards or forwards, to the terrible annoyance of the pawns or common men, who are often in consequence mown down with rapid and tremendous slaughter. Finally, both chess and draughts terminate not unfrequently in the same way, by a check-mate, or complete blockade of the king; with this only difference, that as there is but one king in the usual game of chess, and the whole dignity of the army depends upon him, the game is won the moment he is completely blockaded, whatever the number of officers or of pawns he may have around him; while as the dignity of a king is less considerable in draughts, as well from his plebeian origin, as from the greater number that may exist at the same time, the game does not close by a check-mate, unless every king and pawn is completely checkmated at the same time. From this diminution of dignity also, kings in draughts are liable to the indignity of being taken prisoners like the common men or pawns.

The game of draughts may, with propriety, therefore, be denominated *little chess*; and in reality, this seems to have been very nearly the name by which it was called a few centuries ago: for as the Latin term *ludus latrunculorum*, derived from Seneca, but certainly with an incorrect appropriation, was applied to chess, so the game of draughts was denominated, at the same time, *ludus latrunculorum simplicior*, simpler or little chess.

In playing at draughts, the parties may choose either the black or the white squares, for in this game only one set of squares can be played upon at one time. This being decided, the board must be so placed that the double angle of the playing squares must be at the right hand of each player. The number of men is twelve for each, and being placed, one on each of the black or white squares agreed upon, they will just fill up the first three rows, and leave a sufficient field for operations in the centre.

The first move is to be determined by lot, and the rest afterwards follow alternately as in chess. Every movement must be in a diagonal line forwards alone, and only from square to square. To enable a pawn on one side to take a pawn on the other, immediate proximity is not enough, for there must be a blank behind the pawn that is to be taken; and the pawn that takes him, instead of passing, as in chess, into the square that the captured pawn occupies, leaps over the captured pawn into the blank square, as though he had made two movements, and then takes off the captured pawn from the board.

If the victor pawn, on alighting in the blank square, meet with another hostile pawn in a square immediately adjoining, with another blank behind him, he pursues his career, leaps over this second pawn, which is immediately removed after the manner of the first; and continues the same course, without interruption, as long as he meets with a pawn with a blank square behind to rest in.

A pawn is often moved forward by one of the parties, into a direct approximation with a pawn of the other party, for the express purpose of being taken, in order by such a sacrifice to carry into effect a plan for taking two or three pawns in return, the player perceiving, that by the advance of one of his antagonist's pawns into the square, it must hereby necessarily reach, he will be able not only to take the pawn that so advances, but also several other pawns towards which his own pawn will be led, in consequence of their being unprotected, or having blank squares behind them.

On this account a player is compelled to take a pawn thus situated, and is not left at his option; for if he do not take his adversary's pawn, and moves another instead of the one he ought to move for this purpose, the adversary immediately takes off from the board the pawn that should have moved, as a forfeit, exclaiming, "*I off you,*" or (as it is vulgarly pronounced) "I *hoff* or *huff* you," i. e. I take you off for not taking my pawn: and this action is hence denominated a *hoff* or *huff*.

The direct object of the game, on either side, is to push forward boldly, yet cautiously, towards the adversary's first or hindmost line, and to compel him to break it, and leave one or more blank squares in that quarter. For, as we have already observed, every pawn or man that reaches a blank square in this line is immediately advanced to the dignity of a king, with a power of moving either backward or forward from one square to another, in any diagonal direction at option; and in consequence of being a king, he is immediately crowned, by having another pawn put upon him, significative of his double power of motion; and in this manner each party has often not less than four, five, or more kings at a time.

To obtain this end, the grand principle is, to spread the pawns or men so widely in their advance, as to be able to take every advantage of the enemy that may offer itself, yet to keep them sufficiently close to each other, to afford an easy and effectual protection. The hindmost, or head-line as it is called, is usually advanced last of all; and the player who, by dexterous manoeuvring, is capable of breaking through this part of his adversary's encampment, so as to give a safe admission to one of his pawns, and thus to make a king of him, in an early part of the game, is almost sure of gaining it when the skill is upon a par. And on this account one pawn (and sometimes two) are readily sacrificed to obtain so important an advantage.

This attack is most commonly attempted towards the double-corner, or on the right hand side of the defendant: for here the assault may be conducted with less danger, and the successful pawn, after he has been crowned, returns without interruption or blockade to the field of battle, which is not always the case if he enter in on any other square. This, therefore, is the most important quarter of any, even in the opening of the contest; it is also the most important towards the close; for if one party be weakened, and reduced to two kings by a party who has three, he will be able to defend himself for a very long period of time in this position; and by taking advantage of the movements of the opposite party, and crossing one of his two kings over the board to the opposite double corner, he will effectually prevent him from check-making, or blockading him, and will of course, inferior as he is in number, reduce the battle to a drawn game. In any other outermost square on the draught-board, a pawn or a king may be so placed (as for example, on the square nearest in a straight line, and directly opposite to the former), that the opposite party having to move, is necessarily check-mated or blockaded, and cannot stir without falling a prisoner to the pawn or king that is blockading. Even a pawn alone so situated, would possess the same power over a king so blockaded. But a king, once securing himself in the double angle on the same line, not only requires two pieces to blockade or check-mate him, but both those pieces must first of all be made kings, in order that they may be able to move both backward and forward, without which double power of action they would not be competent to effect a perfect blockade.

Where the pieces are reduced to one on each side, or, as we have already observed, two on the one side, and three on the other, and so situated that it is impossible for either side to blockade or check-mate the other, the battle is denominated a drawn game, and neither party lays claim to the victory.

To DRAW. *v. a.* preter. *drew*; part. pass. *drawn.* (ꝺꞃaȝan, Saxon.) 1. To pull along; not to carry (*Samuel*). 2. To pull forcibly; to pluck (*Atterbury*). 3. To bring by violence; to drag (*James*). 4. To raise out of a deep place (*Jeremiah*). 5. To suck (*Ecclus*). 6. To attract; to call toward itself (*Suckling*). 7. To draw as the magnet does (*Dryden*). 8. To inhale (*Addison*). 9. To take from any thing containing or holding (*Chronicles*). 10. To take off the spit or broacher (*Dryden*). 11. To take from a cask (*Shakspeare*). 12. To pull a sword from the sheath (*Dryden*). 13. To let out any liquid (*Wiseman*). 14. To take bread out of the oven (*Mortimer*). 15. To unclose or slide back curtains (*Dryden*). 16. To close or spread curtains (*Sidney*). 17. To extract (*Cheyne*). 18. To procure, as an agent or cause (*Locke*). 19. To produce, or bring, as an efficient cause (*Tillotson*). 20. To convey secretly or gradually (*Raleigh*). 21 To protract; to lengthen; to spin (*Felton*). 22. To utter lingeringly (*Dryden*). 23. To represent by picture (*Waller*). 24. To form a representative image (*Dryden*). 25. To derive, as from some original (*Temple*). 26. To deduce, as from postulates (*Temple*). 27. To imply (*Locke*). 28. To allure; to entice (*Psalms*). 29. To lead, as a motive (*Dryden*). 30. To persuade to follow (*Shakspeare*). 31. To induce; to persuade (*Davies*). 32. To win; to gain (*Shakspeare*). 33. To receive; to take up (*Shakspeare*). 34. To extort; to force (*Addison*). 35. To wrest; to distort (*Whitgift*). 36. To compose; to form in writing (*Pope*). 37. To withdraw from judicial notice (*Shakspeare*). 38. To eviscerate; to embowel (*King*). 39. *To* DRAW *in.* To apply to any purpose by distortion or violence (*Locke*). 40. *To* DRAW *in.* To contract; to pull back (*Gay*). 41. *To* DRAW *in.* To inveigle; to entice (*Hudibras*). 42. *To* DRAW *off.* To extract by distillation (*Addison*). 43. *To* DRAW *off.* To drain out by a vent (*Mortimer*). 44. *To* DRAW *off.* To withdraw; to abstract (*Addison*). 45. *To* DRAW *on.* To occasion; to invite (*Hayward*). 46. *To* DRAW *on.* To cause; to bring by degrees (*Boyle*). 47. *To* DRAW *over.* To raise in a still (*Boyle*). 48. *To* DRAW *over.* To persuade to revolt; to induce to change a party (*Addison*). 49. *To* DRAW *out.* To protract; to lengthen (*Shakspeare*). 50. *To* DRAW *out.* To beat out, as is done to hot iron (*Moxon*). 51. *To* DRAW *out.* To extract; to pump out by insinuation (*Sidney*). 52. *To* DRAW *out.* To induce by motive (*Hooker*). 53. *To* DRAW *out.* To call to action (*Dryden*). 54. *To* DRAW *out.* To range in battle (*Collier*). 55. *To* DRAW *up.* To form in order of battle (*Clarendon*). 56. *To* DRAW *up.* To form in writing (*Swift*).

To DRAW. *v. n.* 1. To perform the office of a beast of draught (*Deuteronomy*). 2. To act as a weight (*Addison*). 3. To contract; to shrink (*Bacon*). 4. To advance; to move (*Milton*). 5. To come together (*Blackmore*). 6. To draw a sword (*Shakspeare*). 7. To practise the art of delineation (*Locke*). 8. To take a card out of the pack; to take a lot (*Dryden*). 9. To make a sore run by attraction. 10. *To* DRAW *off.* To retire; to retreat (*Collier*). 11. *To* DRAW *on.* To advance; to approach (*Dryden*). 12. *To* DRAW *up.* To form troops into regular order (*Clarendon*).

DRAW. *s.* (from the verb.) 1. The act of drawing. 2. The lot or chance drawn.

DRAWBACK, in commerce, certain duties, either of the customs or of the excise, allowed upon the exportation of some of our own manufactures; or upon certain foreign merchandise, that have paid duty on importation. The oaths of the merchants importing and exporting are required to obtain the drawback on foreign goods, affirming the truth of the officer's certificate on the entry, and the due payment of the duties: and these may be made by the agent or husband of any corporation or company; or by the known servant of any merchant usually employed in making his entries, and paying his customs.

DRAWBRIDGE, a bridge made after the manner of a floor, to draw up, or let down, as occasion serves, before the gate of a town or castle. See Bridge.

A drawbridge may be made after several different modes, but the most common are made with plyers, twice the length of the gate, and a foot in diameter. The inner square is traversed with a cross, which serves for a counterpoise; and the chains which hang from the extremities of the plyers, to lift up or let down the bridge, are of iron or brass. In navigable rivers it is sometimes necessary to make the middle arch of bridges with two moveable platforms, to be raised occasionally, in order to let the masts and rigging of vessels pass through.

DRAW-NET, a device for catching birds, and especially woodcocks, with a net fixed in a particular manner. The following is the most generally applicable, and consequently the most convenient plan: for the explanation of which see Plate 92, fig. 2.

Pitch upon some clear place on the side of a forest; for example, suppose AD to be the forest, and the space between the tree A and the letter E, to be the void space, five or six fathoms broad; pitch upon a tall and straight tree on the side of the wood, as that marked A, lop off the branches towards your clear ground, and fasten to the top of the tree a strong pole, as K, R, Z: find out a tree in the wood of a middling size, as that represented by E, F, let it be as high and straight as possible; when you have taken off all the branches, carry it to the place where your draw-net lies, and making a hole in the ground, as at E, four or five feet deep, and six or seven fathom distant from the edge of the forest A, put the thick end of it into this hole, lift it up, and let it stand upright, after you have first tied within two or three feet of the end F, some bands of wood, fastened endwise to each other, as *a*, *b*, *c*, *d*, *e*, *f*, &c. and then let them be kept tight, with wooden hooks fixed quite round in the ground: they should be nine feet distant from the foot E, and managed like ropes at the mast of a ship: at the same time care must be taken that none of them reach to the glade, or space between A and E, for fear of entangling the net. Set the tree which you have cut, so that the point F incline two feet, or thereabouts, towards the pass to the forest; and fasten the pulley C to the small end, with a cord or packthread thrust through it; as also to the tree A, and through the pulley L. Leave the thick cords there; or as thieves might be tempted to steal them, the best way is to leave only the packthreads, and even to shorten them, by tying a small packthread B to one end, and twisting the others about the trunk of the tree, at a place where they are not to be reached, especially with climbing up as far as the part H of the cut tree: or else take with you a light ladder, six or eight feet high, by which means you may most easily secure your implements.

Another invention is, after the flight is over, to tack two cords together, by means of which you may convey up as many stones as far as the pulleys; then take a stick V, two feet long, and cleft at both ends, about which fold all the rest of the cords; after which pass them both into the clefts at the ends of the stick, and let the whole mount up. Thus the stones S, T, will come down to half the height of the trees, because the cords are tied together at the letter X, and there will the stick V hang downwards: so that to order things rightly, you must have a long pole with a hook at the end, with which to hook the piece of wood V, and pull it; or else take a packthread, and tie a stone as big as a hen's egg to it, that you may throw it between the two cords over the stick V, and by that means pull it as with a hook. It remains only to observe, that you may place several draw-nets round about the forest, and that one man alone may pitch ten or a dozen of the triple ones.

This article might be thought imperfect, unless something should be observed relating to the flying, or buckled draw-net, by some called pantine; which is of use in all places, and especially in countries where there is nothing but coppices and forests, whose owners will not allow the felling any trees, or cutting of branches, necessary for the use of the former net. See Plate 92, fig. 3.

Take two poles, as E, B, D, C, as thick as your arm, of twenty-one feet long; straight and light, and pointed at the thick end: fasten to each small end B, D, an iron, copper, or such like buckle, to serve instead of a pulley; have also a draw-net with buckles, into which you must pass a strong packthread, that is even, and twelve fathoms long: see the letters B, G, D, F; fold it, that it may not be entangled with the net; and have a wooden hook F, of a foot long, for the convenience of carrying your implements, to use as you have occasion.

This draw-net must be pitched no where but on the sides of a coppice, near some vineyard, in the highways or walks in a forest or park; especially when these places adjoin fields, or open grounds, in the middle or between woods. You may likewise spread this net along a brook, at the bottom of a pond, and indeed, in all places frequented by woodcocks. You must use it in the following manner:

Suppose the tree L, be the side of the wood, or some other place where you have a mind to pitch your net, you must unfold it, and take an end of the thick packthread which passes through the buckle, and tie it to the end of the pole at the letter B; pass a small packthread E, K, into the buckle which is at the end B, and tie it to the first buckle B of the net, that you may draw it like a bed-curtain; then stick the pole B, E, quite round the wood L, in such a manner, that it may stand firm in the ground, and slope a little towards the tree. Take the other end of the thick packthread F, and pass it also into the buckle or ring D, which you are likewise to pitch into the ground, about five or six fathom distant from the other pole B, E; then withdraw seven or eight fathoms distant from the net, to the foot of some tree or bush, or else to some branch which you have pitched upon on purpose, over against the net, as at the place marked F; here fix the hook, and tie the end of the thick packthread, and then pull the whole till the net is mounted; next twist the cord twice or thrice about the hook, that you may keep it tight, while you proceed to pull the small packthread E, in order to extend the net; when this is done return to the hook, unfold the cord, and sit near the bush or cover, without stirring, having your eye always to the net, that you may let it fall when the woodcock gets into it, which you must kill as soon as taken; when setting your net readily again, proceed as before. It would not be amiss to put a small packthread into the last buckle D of the net, as on the other side, by which you will adjust the draw-net the more easily.

This sort of draw-net should have no other than lozenge meshes, because they must glide along the cords, like a bed-curtain; the net should not be above five or six fathoms wide, and two and a half or three in height. The meshes should be two inches broad, or two and a half or three at most; the net should be made of fine but strong thread, and the copper buckles fastened to all the meshes of the last upper row B, D; the lever must be made twice as long as you would have the net to be in extent; then having a quarter more than the measure of the height, you must accommodate the buckles, which being adjusted in the manner in which they ought to stand, pass a middling cord, or packthread as thick as a writing-pen, into all these buckles.

You should have two other small packthreads B, G, D, C, which you must pass into the last range of the meshes of both sides, one of which must be fastened to the buckle B, and the other to that at D, in order to keep the net right when you make use of it; and therefore the two ends E and G must be loose, and longer than the height of the net by ten or twelve feet: this net must be of a brown colour.

Draw-nets are usually made with lozenge meshes, because there are few persons who know how to make them otherwise, but here more thread and labour are required than in those with square meshes, which are made sooner, and have no superfluous meshes. However, every one is at liberty in their choice for both may be employed with advantage.

If you prefer a draw-net with lozenge meshes, measure the breadth of the place where you are to spread it, and let the net be near twice as long as that measure. Its height should be from that branch where the pulley is, to within two feet of the ground. The breadth is from the letter V to the letter X: being the places where the stones should fall, which are supposed to be fastened at M and N; when the net is spread, the height should be taken from the pulley to reach near the letter X; the net must therefore be made one-third part longer than the height; for being extended in breadth, it will shorten by one-third; when the whole net is meshed, you must have a cord not quite so thick as your little finger, through all the meshes of the last range M, N; you must fasten both sides, trying the six first meshes of the row together to the cords so that they may slip along; do the same by the other side; these two places must be distanced, according to the width of the pass, leaving the rest of the meshes of the net above loose, so as to slip or be drawn from one side to the other, like a bed-curtain: then to each of these cords tie a packthread, which you must pass into the last range of meshes on the sides, that so you may fasten the net as it should be, to two trees, A, B; a foot or two of the cord should be suffered to hang down at each end of the net, with which to tie the stones, when you would spread it.

If you prefer a draw-net with square meshes, take the breadth and height, and work as aforesaid: when the net is finished, verge it above with a pretty strong cord, and pass two packthreads through the meshes, on both sides, in the same manner as in that made lozenge-wise, and leave also both ends of the cord, so that the stones may be tied with them.

DRA'WER. *s.* (from *draw.*) 1. One employed in procuring water from the well (*Deuteronomy*). 2. One whose business is to draw liquors from the cask (*Ben Jonson*). 3. That which has the power of attraction (*Swift*). 4. A box in a case, out of which it is drawn at pleasure (*Locke*). 5. (In the plural.) The under part of a man's femoral dress (*Locke*). 6. He who draws a bill of exchange.

DRAWING, an art which consists in justly representing the appearances of objects, upon paper or any plain surface, by means of lines and shades, formed with certain colouring materials adapted to the purpose.

SECT. I. *Of the Materials used for Drawing, and the Manner of employing them.*

Whoever would acquire this elegant art, must begin by furnishing himself with proper materials, such as black-lead pencils, crayons of black, white, or red chalk, crow-quill pens, a ruler and compasses, camels-hair pencils, and Indian ink. He must accustom himself to hold the pencil farther from the point than a pen is held in writing; which will give him a better command of it, and contribute to render his strokes more free and bold. The use of the pencil is to draw the first sketch or outline of the piece, as any stroke that is amiss may in this be easily rubbed out; and when he has made the sketch as correct as he can with the pencil, he may then draw carefully the best outline he has got, with his crow-quill pen dipped in a liquid Indian ink; after which he may discharge the pencil-lines, by rubbing the piece gently with the crumb of stale bread or Indian rubber. Having thus got the outline clear, his next work is to shade the piece properly, either by drawing fine strokes with his pen where it requires to be shaded, or by washing it with his pencil and the Indian ink. As to his ruler and compasses, they are never or very rarely to be used, except in measuring the proportions of figures after he has drawn them, to prove whether they are right or not; or in houses, fortifications, and other works of architecture.

Having got all these implements in readiness, the first practice must be to draw straight and curve lines, with ease and freedom, upwards and downwards, sideways to the right or left, or in any direction whatsoever. He must also learn to draw accurately, by command of hand only, squares, circles, ovals, and other geometrical figures: for as the alphabet, or a knowledge of the letters, is an introduction to grammar; so is geometry to drawing. The practice of drawing these simple figures till he is master of them, will enable him to imitate, with greater ease and accuracy, many appearances both in nature and art. And here it is proper to admonish him never to be in a hurry; but to make himself perfectly master of one figure before he proceeds to another: the advantage, and even necessity, of this, will appear as he proceeds. Two observations more may be added: 1. That he accustom himself to draw all his figures very large, which is the only way of acquiring a free bold manner of designing. 2. That he practise drawing till he has gained a tolerable mastership of his pencil, before he attempts to shadow any figure or object of any kind whatever.

SECT. II. *Of the Method of drawing Eyes, Ears, Legs, Arms, Hands, Feet, &c.*

As to the drawing of eyes and ears, legs and arms, the learner will have very little more to do than to copy carefully the different examples given in Plate 64, taken from one of the most approved drawing-books extant. But the actions and postures of the hands are so many and various, that no certain rules can be given for drawing them that will universally hold good. Yet as the hands and feet are difficult members to draw, it is very necessary, and well worth while, to bestow some time and pains about them, carefully imitating their various postures and actions, so as not only to avoid all sameness and imperfection, but also to give them life and spirit. To arrive at this, great care, study, and practice, are requisite; particularly in imitating the best prints or drawings that can be got of hands and feet; for, as to the mechanical way of drawing them by lines and measures, they are not only perplexed and difficult, but also contrary to the practice of the best masters. One general rule, however, may be given (which is universally to be observed in all subjects); viz. not to finish perfectly, at first, any single part, but to sketch out faintly, and with light strokes of the pencil, the shape and proportion of the whole hand, with the action and turn of it; and after considering carefully whether this first sketch be perfect, and altering it wherever it is amiss, you may then proceed to the bending of the joints, the knuckles, the veins, and other small particulars, which, when the learner has got the whole shape and proportion of the hand or foot, will not only be more easily, but also more perfectly done.

SECT. III. *Of drawing the Human Face.*

It is usual with artists to divide the head into four equal parts. 1. From the crown of the head to the top of the forehead. 2. From the top of the forehead to the eye-brows. 3. From the eye-brows to the bottom of the nose. 4. From thence to the bottom of the chin. But this proportion is not constant; those features in different men being often very different as to length and shape. In a well-proportioned face, however, they are nearly right. To direct the learner, therefore, in forming a perfect face, his first business is to draw an oval, or rather the form of an egg; in the middle of which, from the top to the bottom, draw a perpendicular line. Through the centre or middle of this line draw a diameter line, directly across from one side to the other of your oval. On these two lines all the features of the face are to be placed as follows: Divide your perpendicular line into four equal parts: the first must be allotted to the hair of the head; the second is from the top of the forehead to the top of the nose between the eye-brows; the third is from thence to the bottom of the nose; and the fourth includes the lips and chin. Your diameter line, or the breadth of the face, is always supposed to be the length of five eyes; you must, therefore, divide it into five equal parts, and place the eyes upon it so as to leave exactly the length of one eye betwixt them. This is to be understood only of a full front face, as *a* in Plate 65; for if it turn to either side, then the distances are to be lessened on that side which turns from you, less or more, in proportion to its turning, as in the examples *bbb*. The top of the ear is to rise parallel to the eye-brows, at the end of the diameter line; and the bottom of it must be equal to the bottom of the nose. The nostrils ought not to come out farther than the corner of the eye in any face; and the middle of the mouth must always be placed upon the perpendicular line.

SECT. IV. *Of delineating Human Figures.*

When the pupil is become tolerably expert in drawing faces, heads, hands, and feet, he may next attempt to draw the whole of the human figure at length. In order to this, let him first sketch the head; then draw a perpendicular line from the bottom of the head seven times its length (for the length of the head is about one-eighth part of the length of the figure). The best proportioned figures of the ancients are 7¾ heads in height. If, therefore, the figure stands upright, as in the example *a*, Plate 64, draw a perpendicular line from the top of the head to the heel, which must be divided into two equal parts. The bottom of the belly is exactly the centre. Divide the lower part into two equal parts again, the middle of which is the middle of the knee. For the upper part of the figure, the method must be varied. Take off with your compasses the length of the face (which is three parts in four of the length of the head); from the throat-pit to the pit of the stomach is one face, from thence to the navel is another, and from thence to the lower rim of the belly is a third. The line must be divided into seven equal parts. Against the end of the first division place the breasts; the second comes down to the navel; the third to the privities; the fourth to the middle of the thigh; the fifth to the lower part of the knee; the sixth to the lower part of the calf; and the seventh to the bottom of the heel, the heel of the bearing-leg being always exactly under the pit of the throat. But as the essence of all drawing consists in making at first a good sketch, the learner must in this particular be very careful and accurate; he ought to draw no one part perfect or exact till he see whether the whole draught be good; and when he has altered that to his mind, he may then finish one part after another as exactly as he is able.

Some artists, in copying a statue, begin with the head, which they finish, and then proceed in the same manner to the other parts of the body, finishing as they go on: but this method is a bad one; for if they make the head in the least too big or too little, the consequence is a disproportion between all the parts, occasioned by their not having sketched the whole proportionably at first. Let the learner remember, therefore, in whatever he intends to draw, first to sketch its several parts, measuring the distances and proportions between each with his finger or pencil, without using the compasses; and then judge of them by the eye, which by degrees will be able to judge of truth and proportion, and will become his best and principal guide. And let him observe, as a general rule, always to begin with the right side of the piece he is copying: for by that means he will always have what he has done before his eyes; and the rest will follow more naturally, and with greater ease: whereas if he begin with the left side, his hand and arm will cover what he does first, and deprive him of the sight of it; by which means he will not be able to proceed with so much alacrity.

With regard to the proper order and manner of proceeding in drawing the human body, he must first sketch the head; then the shoulder in the exact breadth; then draw the trunk of the body, beginning with the arm-pits (leaving the arms till afterwards), and so draw down to the hips on both sides; and be sure he observe the exact breadth of the waist. When he has done this, let him then draw that leg which the body stands upon, and afterwards the other which stands loose; then the arms, and last of all the hands. He must take notice also of the bowings and bendings that are in the body; making the part which is opposite to that which bends correspond to it. For instance: if one side of the body bend in, the other must stand out answerable to it; if the back bend in, the belly must stick out; if the knee bend out, the ham must fall in; and so of any other joint in the body. Finally, he must endeavour to form all the parts of the figure with truth, and in just proportion: not one arm or one leg bigger or less than the other; not broad Herculean shoulders, with a thin and slender waist; nor raw and bony arms, with thick and gouty legs: but let there be a kind of harmonious agreement amongst the members, and a beautiful symmetry throughout the whole figure.

SECT. V. *Of the Proportions and Measures of the Human Body.*

The centre or middle part, between the two extremes of the head and feet of a new-born child, is in the navel, but that of an adult is in the os pubis; and the practice of dividing the measures of children into four, five, or six parts, whereof the head is one, is made use of by painters and sculptors. A child of two years old has about five heads in its whole length, but one of four or five years old has near six; about the fifteenth or sixteenth year, seven heads are the proportion or measure, and the centre inclines to the upper part of the pubis. Hence it appears, as the growth of the body advances there is a gradual approach to the proportion of an adult of near eight heads in the whole length, of which, as mentioned above, the head makes one.

In conformity to these principles, the following table is constructed, exhibiting the proportions of the parts of a man and of a woman, as they were fixed by the ancients, and measured by M. Audran from the Apollo Pythius in the garden of the Vatican at Rome, and the Venus Aphroditus belonging to the family of Medicis. Supposing the figures to stand upright and duly poised on both legs, the whole height of the former is divided into 31½ parts, being 7 heads, 3 parts, and 6 minutes; and that of the latter into 31 parts, being 7 heads and 3 parts.

Length of the Head and Trunk of the Body.	*Apollo.*			*Venus.*		
	Hds	Pts.	Min.	Hds.	Pts.	Min.
From the top of the head to the bottom of the chin 4 parts or . .	1	0	0	1	0	0
the bottom of the chin to the top of the sternum or breast-bone .	0	1	7	0	1	8
the top of the sternum to the pit of the stomach	0	3	10	0	3	6
the pit of the stomach to the navel	0	2	10	0	2	7
the navel to the pubis	0	3	6	0	3	9
Length of the head and trunk of the body	3	3	9	3		
Length of the Lower Extremities.						
From the pubis to the small of the thigh above the patella or knee-pan .	1	2	6	1	2	3
the small of the thigh to the joint or middle of the knee . .	0	1	9	0	1	6
the joint of the knee to the small of the leg above the ankle .	1	1	9	1	2	0
the top to the bottom of the ankle	0	1	0	0	1	0
the bottom of the ankle to the bottom of the heel . . .	0	0	9	0	0	9
Length of the lower extremities	3	3	9	3	3	6
Length of the head and trunk, as above	3	3	9	3	3	6
Total length of the figures	7	3	6	7	3	0
Length of the Fore-Arm or Upper Extremities.						
From the top of the shoulder to the elbow	1	2	3	1	2	3
the elbow to the hand	1	1	2	1	0	6
the joint of the hand to the root of the middle finger . . .	0	1	8	0	1	6
the root to the tip of the middle finger	0	1	10	0	1	7
Length of the upper extremities	3	2	11	3	1	10

	Apollo.			Venus.		
	Hds.	Pts.	Min	Hds.	Pts.	Min.
Breadth between the outward angles of the eyes	0			0	1	7
of the face at the temples	0			0	2	2
of the upper part of the neck	0			0	1	11
over the shoulders	2			1	3	8
of the body below the arm-pits	1			1	1	8
between the nipples	1			0	3	8
from the bottom of the chin to the horizontal line of the nipples	1			1	0	1
of the body at the small of the waist	1			1	0	8
over the loins or os ilium	1			1	1	6
over the haunches or tops of the thigh-bones	1			1	2	3
of the thigh at the top	0			0	3	1
of the thigh below the middle	0			0	2	7
of the thigh above the knee	0			0	2	0
of the leg below the knee	0			0	1	10½
at the calf of the leg	0			0	2	3
below the calf	0			0	1	11½
above the ankle	0			0	1	2
of the ankle	0			0	1	3
below the ankle	0			0	1	1
middle of the foot	0			0	1	3
at the roots of the toes	0			0	1	7
of the arm over the biceps muscle	0			0	1	9
of the arm above the elbow	0	1	6	0	1	5
of the arm below the elbow over the long supinator	0	1	10	0	1	7
at the wrist	0	1	1	0	1	0
of the hand over the first joint of the thumb	0	1	9	0	1	8
of the hand over the roots of the fingers	0	1	7	0	1	6
over the heads of the scapulæ or shoulder blades	1	2	0	1	1	4
Length of both arms and hands, each of the Apollos being 3h. 2p. 11m. and the Venus 3h. 1p. 5m.	7	1	10	6	2	10
Breadth betwixt the tips of the middle fingers of each hand when the arms are stretched out horizontally	6	3	10	8	0	2

Side View.

Length from the top of the head to the shoulder	1	1	8	1	1	6
from the top of the shoulder to the loins above the hip	1	3	3	1	1	7
from the loins to the lower part of the hip	1	0	2	1	2	1
from the hip to the side of the knee, opposite to the top of the patella	1	2	0	1	0	11
from the side of the knee to the bottom of the heel	2	0	5	2	0	11
Length of the figures	7	3	6	7	3	0

Side View.

Thickness from the fore to the back part of the skull	0	3	6	0	3	4
from the wing of the nose to the tip of the ear	0	1	8½	0	1	6
of the upper part of the neck	0	2	0	0	1	11
from the breast to the back over the nipples	1	0	6	1	0	6
from the belly to the small of the back	0	3	6	0	3	7
from the belly above the navel to the back of the loins	0	3	9	1	0	2
from the bottom of the belly to the round of the hip	1	0	0	1	0	5
from the fore part of the thigh to the bottom of the hip	0	3	2	0	3	7
of the thigh at the middle	0	3	3	0	3	6½
of the thigh above the knee	0	2	1	0	2	3
at the middle of the knee below the patella	0	2	1	0	2	2
of the leg below the knee	0	1	9	0	1	11
of the leg at the calf	0	1	8	0	1	9
of the leg at the ankle	0	1	5½	0	1	4
of the foot at the thickest part	0	0	0	0	1	3
length of the foot	1	0	6	1	0	4½
from the fore-part of the bend of the foot to the lower and back part of the heel	0	0	0	0	2	2
of the arm over the biceps	0	2	0	0	1	9
over the elbow	0	1	6	0	1	6
below the elbow	0	1	5	0	1	7
at the wrist	0	1	1	0	0	11
below the joint of the wrist	0	1	0	0	0	10
of the hand at the roots of the fingers	0	0	5½	0	0	5
at the roots of the nails	0	0	3½	0	0	3

The other most admired antique statues differ a little from these proportions, the Laocoon measuring 7h. 2p. 3m. the Hercules 7h. 3p. 7m. the Pyramus 7h. 2p. the Antinous 7h. 2p. the Grecian shepherdess 7h. 3p. 6m. and the Mirmillo 8h. But all their other proportions are allowed to be harmonious and agreeable to the characters they represent.

The most remarkable differences of the symmetry or proportions of a man and of a woman to be observed from the table are: First, the shoulders of a man are broader, measuring two heads; and the haunches narrower, measuring 1h. 1p. 5m. whereas the shoulders of a woman measure only 1h. 3p. 8m. and the haunches measure 1h. 2p. 5m. The sternum, or breast bone of a man is longer, measuring 3p. 8m. and the sternum of the woman only 3p. 3m. On the contrary, the pelvis of a man is less, measuring from the top to the bottom only 4p. whereas the pelvis of a woman measures from the top to the bottom 4p. 3m.

It is a leading principle, in which every person conversant in designing has agreed, that without a perfect knowledge of the proportions, nothing can be produced but monstrous and extravagant figures; and it is also universally admitted, that the ancient Greek and Roman sculptors attained the highest success in producing the most perfect models. Indeed, the greatest of the modern artists who have examined their figures with attention admit, that several of the ancient sculptors in some degree have excelled nature, they never having found any man so perfect in all his parts as some of their figures are. Their opportunities indeed were great: Greece abounded with beauties; and Rome being mistress of the world, every thing that was curious and beautiful was brought to it from all parts. Their motives were also powerful; religion, glory, and interest. They considered it as a kind of religious worship to give the figures of their gods so much nobleness and beauty as to be able to attract the love and veneration of the people. Their own glory was also concerned, particular honours being bestowed on those who succeeded; and for their fortune they had no further care to take when they once arrived at a certain degree of merit.

SECT. VI. *Of the different Attitudes of the Human Figure.*

If we are to represent, in a state of vigorous action, a figure such as that of Hercules, it is of importance to attend to the parts or limbs principally employed in performing that action. If the figure is standing, the foot must be placed in a right line, or perpendicular to the trunk or bulk of the body, where the centre of gravity may be supposed to fall This centre is determined by the heel; or, if the figure is upon tiptoe, then the ball of the great toe is in the centre. The muscles of the leg which supports the body ought to be swelled, and their tendons drawn more to an extension than those of the other leg, which is only placed so as to receive the weight of the body towards that way to which the action inclines it. For example, suppose Hercules with a club striking at any thing before him towards the left side: then let his right leg be placed so as to receive the whole weight of the body, and the left loosely touching the ground with its toes. Here the external muscles of the right leg ought to be expressed very strong; but those of the left scarcely appearing more than if it were in some sedentary posture, except in the present case. The foot being extended, the muscles which compose the calf of the leg are in action, and appear very strong; though it is not meant that all the muscles of the right leg, which supports the weight of the body, ought to be expressed very strong or equally swelled, but those most tumefied which are chiefly concerned in the action or posture that the leg is then in. For example, if the leg or tibia is extended, then the extending muscles placed on the thigh are most swelled: if it be bent, then the bending muscles and their tendons appear most. The like may be observed of the whole body in general when it is put into vigorous action. The Laocoon, formerly in the Vatican garden at Rome, furnishes an example of this muscular appearance through the whole; but in the Antinous, Apollo, and other figures of the ancients, in the Vatican and other places, in postures where no considerable actions are designed, we see their muscles expressed but faintly, or scarcely to be discerned.

In general, neither the clavicles or collar bones, nor the muscles, appear so strongly in women as in men; nor will any action in which a woman uses her utmost strength occasion such swellings or risings of the muscles as to give the appearance they do in men, since besides the greater quantity of fat placed under the skin in women, their muscles are by no means so large and conspicuous.

SECT. VII. *Effects of the Exertion of the Muscles.*

It is of great importance to an artist to be acquainted with the most obvious effects of the action of those muscles which are placed externally on the human body; for these vary with every alteration of posture, and are variously enlarged and changed in their appearance by every effort that is dictated by the will.

Thus, if either of the mastoid muscles act, the head is turned to the contrary side, and the muscle which performs that action appears very plain under the skin. If the arms are lifted up, the deltoid muscles placed on the shoulders, which perform that action, swell, and make the extremities of the spines of the shoulder-blades, called the tops of the shoulders, appear indented or hollow. The shoulder-blades following the elevation of the arms, their bases incline at that time obliquely downward If the arms are drawn down, put forwards, or pulled backwards, the shoulder-blades necessarily vary their positions accordingly. All these particulars are to be learned by consulting the life only: when being well acquainted with what then appears in every action, the artist will be able to form an adequate idea how it ought to be expressed. These circumstances are little known; and seldom enough attended to in designing.

When the cubit or fore-arm is bent, the biceps has its belly very much raised The same happens in the triceps, when the arm is extended. The straight muscles of the abdomen appear very strong when rising from a decumbent posture. Those parts of the great serratus muscle which are received in the teeth or beginnings of the obliquus descendens muscle immediately below, are very much swelled when the shoulder on the same side is brought forwards; that serratus muscle then being employed in drawing the scapula forwards.

The long extending muscles of the trunk act alternately in walking, after this manner: if the right leg bears the weight of the body, and the left is in translation as on tiptoe, the last mentioned muscles of the back on the left side may be observed to be tumefied on the other side about the region of the loins, and so on the other side. The trochanters, or outward and uppermost heads of the thigh-bones, vary so greatly in their positions, that no precise observations can explain their several appearances; but the study after the life ought to be chiefly relied on. If the thigh is extended, as when the whole weight of the body rests on that side, the glutæus or buttock muscle makes a very different appearance from what offers at another time; but if the thigh be drawn backwards, that muscle appears still more and more tumefied. When the whole leg is drawn upwards and forwards, and at the same time the foot is inclined inwards, the upper part of the sartorius muscle appears to rise very strong; in other positions of the thigh, that muscle makes a furrowing appearance in its whole progress. If a man is upon tiptoe, the extending muscles of the leg placed on the fore part of the thigh, and those of the foot that compose the calf of the leg, appear very strong, and the long peronæus makes a considerable indentation or furrowing at that time, in its progress on the outside of the leg.

SECT. VIII. *Of the Distribution of Light and Shade.*

As soon as the learner has made himself in some measure perfect in drawing outlines, his next endeavour must be to shade them properly. It is this which gives an appearance of substance, shape, distance, and distinction, to whatever bodies he endeavours to represent, whether animate or inanimate. The best rule for doing this is, to consider from what point, and in what direction, the light falls upon the objects which he is delineating, and to let all his lights and shades be placed according to that direction throughout the whole work. That part of the object must be lightest which has the light most directly opposite to it: if the light falls sideways on the picture, he must make that side which is opposite to it lightest, and that side which is farthest from it darkest. If he is drawing the figure of a man, and the light be placed above the head, then the top of the head must be made lightest, the shoulders next lightest, and the lower parts darker by degrees. That part of the object, whether in naked figures, or drapery, or buildings, that stands farthest out, must be made the lightest, because it comes nearest to the light; and the light loses so much of its brightness, by how much any part of the body bends inward, because those parts that stick out hinder the lustre and full brightness of the light from striking on those parts that fall in. Titian used to say, that he knew no better rule for the distribution of lights and shadows, than his observations drawn from a bunch of grapes. Satins and silks, and all other shining stuffs, have certain glancing reflections, exceedingly bright where the light falls strongest. The like is seen in armour, brass pots, or any other glittering metal, where you see a sudden brightness in the middle or centre of the light, which discovers the shining nature of such things. Observe also, that a strong light requires a strong shade, a fainter light a fainter shade; and that an equal balance be preserved throughout the piece, between the lights and shades. Those parts which must appear round require but one stroke in shading, and that sometimes but very faint; such parts as should appear steep or hollow, require two strokes across each other, or sometimes three, which is sufficient for the deepest shade. Care must be also taken to make the outlines faint and small in such parts as receive the light; but where the shades fall, the outline must be strong and bold. The learner must begin his shadings from the top, and proceed downward, and use his utmost endeavours both by practice and observation to learn how to vary the shadings properly; for in this consists a great deal of the beauty and elegance of drawing. Another thing to be observed is, that as the human sight is weakened by distances, so objects must seem more or less confused or clear according to the places they hold in the piece. Those that are very distant must be weak, faint, and confused; those that are near and on the foremost ground, clear, strong, and accurately finished.

SECT. IX. *Of Drapery.*

In the art of clothing the figures, or casting the drapery properly and elegantly upon them, many things are to be observed. 1. The eye must never be in doubt of its object; but the shape and proportion of the part or limb, which the drapery is supposed to cover, must appear; at least so far as art and probability will permit: and this is so material a consideration, that many artists draw first the naked figure, and afterwards put the garments upon it. 2. The drapery must not sit too close to the parts of the body: but let it seem to flow round, as it were to embrace them; yet so as that the figure may be easy, and have a free motion. 3. The draperies which cover those parts that are exposed to great light must not be so deeply shaded as to seem to pierce them; nor should those members be crossed by folds that are too strong, lest by the too great darkness of their shades the limbs look as if they were broken. 4. The great folds must be drawn first, and then stroked into lesser ones: and great care must be taken that they do not cross one another improperly. 5. Folds in general should be large, and as few as possible. However, they must be greater or less according to the quantity and quality of the stuffs of which the drapery is supposed to be made. The quality of the persons is also to be considered in the drapery. If they are magistrates, their draperies ought to be large and ample; if country clowns or slaves, they ought to be coarse and short; if ladies or nymphs, light and soft. 6. Suit the garments to the body, and make them bend with it, according as it stands in or out, straight or crooked; or as it bends one way or another; and the closer the garment fits to the body, the narrower and smaller must be the folds. 7. Folds well imagined give much spirit to any kind of action; because their motion implies a motion in the acting member, which seems to draw them forcibly, and makes them more or less stirring as the action is more or less violent. 8. An artful complication of folds in a circular manner greatly helps the fore-shortenings. 9. All folds consist of two shades, and no more; which you may turn with the garment at pleasure shadowing the inner side deeper, and the outer more faintly. 10. The shades in silk and fine linen are very thick and small, requiring little folds and a light shadow. 11. Observe the motion of the air or wind, in order to draw the loose apparel all flying one way: and draw that part of the garment that adheres closest to the body before you draw the looser part that flies off from it; lest, by drawing the loose part of the garment first, you should mistake the position of the figure, and place it improperly. 12. Rich ornaments, when judiciously and sparingly used, may sometimes contribute to the beauty of draperies. But such ornaments are far below the dignity of angels or heavenly figures; the grandeur of whose draperies ought rather to consist in the boldness and nobleness of the folds than in the quality of the stuff or the glitter of ornaments. 13. Light and flying draperies are proper only to figures in strong motion, or in the wind: but when in a calm place, and free from violent action, their draperies should be large and flowing; that, by their contrast and the fall of the folds, they may appear with grace and dignity. Thus much for drapery; examples of which, as well as of human character and the passions, we have given in Plate 66; being outline sketches from Raphael's Cartoons of the blindness of Elymas the sorcerer, and of Paul preaching at Athens. See CARTOONS.

SECT. X. *Of the Effects of the Passions.*

The passions, says M. Le Brun, are motions of the soul, either upon her pursuing what she judges to be for her good, or shunning what she thinks hurtful to her; and commonly, whatever causes emotion or passion in the soul creates also some action in the body. It is, therefore, necessary for a painter to know which are the different actions in the body that express the several passions of the soul, and how to delineate them. M. Le Brun has been extremely happy in expressing many of the passions, and the learner cannot study any thing better than the examples which he has left us of them. However, as M. De Piles justly observes, it is absurd as well as impossible to pretend to give such particular demonstrations of them as to fix their expression to certain strokes, which the painter should be obliged to make use of as essential and invariable rules. This, says he, would be depriving the art of that excellent variety of expression which has no other principle than diversity of imagination, the number of which is infinite. The same passion may be finely expressed several ways, each yielding more or less pleasure in proportion to the painter's understanding and the spectator's discernment.

Though every part of the face contributes towards expressing the sentiments of the heart, yet the eye-brow, according to M. Le Brun, is the principal seat of expression, and where the passions best make themselves known. It is certain, says he, that the pupil of the eye, by its fire and motion, very well shows the agitation of the soul, but then it does not express the kind or nature of such an agitation; whereas the motion of the eye-brow differs according as the passions change their nature. To express a simple passion, the motion is simple; to express a mixed passion, the motion is compound: if the passion be gentle, the motion is gentle; and if it be violent, the motion is so too. We may observe farther, says he, that there are two kinds of elevation in the eye-brows. One, in which the eye-brows rise up in the middle; this elevation expresses agreeable sensations, and it is to be observed that then the mouth rises at the corners: another, in which the eye-brows rise up at the ends, and fall in the middle; this motion denotes bodily pain, and then the mouth falls at the corners. In laughter, all the parts agree; for the eye-brows, which fall toward the middle of the forehead, make the nose, the mouth, and the eyes, follow the same motion. In weeping, the motions are compound and contrary; for the eye-brows fall toward the nose and over the eyes, and the mouth rises that way. It is to be observed also, that the mouth is the part of the face which more particularly expresses the emotions of the heart: for when the heart complains, the mouth falls at the corners; when it is at ease, the corners of the mouth are elevated; and when it has an aversion, the mouth shoots forward, and rises in the middle.

"The head (says M. De Piles) contributes more to the expression of the passions than all the other parts of the body put together. Those separately can only show some few passions, but the head expresses them all. Some, however, are more peculiarly expressed by it than others: as humility, by hanging it down; arrogance, by lifting it up; languishment, by inclining it on one side; and obstinacy, when with a stiff and resolute air it stands upright, fixed, and stiff between the two shoulders. The head also best shows our supplications, threats, mildness, pride, love, hatred, joy, and grief. The whole face, and every feature, contributes something: especially the eyes; which, as Cicero says, are the windows of the soul. The passions they more particularly discover are, pleasure, languishing, scorn, severity, mildness, admiration, and anger; to which one might add joy and grief, if they did not proceed more particularly from the eye-brows and mouth; but when those two passions fall in also with the language of the eyes, the harmony will be wonderful. But though the passions of the soul are most visible in the lines and features of the face, they often require the assistance also of the other parts of the body. Without the hands, for instance, all action is weak and imperfect; their motions, which are almost infinite, create numberless expressions: it is by them that we desire, hope, promise, call, send back; they are the instruments of threatening, prayer, horror, and praise; by them we approve, condemn, refuse, admit, fear, ask; express our joy and grief, our doubts, regrets, pain, and admiration. In a word, it may be said, as they are the language of the dumb, that they contribute not a little to speak a language common to all nations, which is the language of painting. But to say how these parts must be disposed for expressing the various passions is impossible, nor can any exact rules be given for it, both because the task would be infinite, and because every one must be guided in this by his own genius and the particular turn of his own studies."

SECT. XI. *Of drawing Flowers, Fruit, Birds, &c.*

It may not be improper for the learner now to proceed in making some attempts at drawing flowers, fruit, birds, beasts, and the like; not only as it will be a more pleasing employment, but as it is an easier task than the drawing of hands and feet, and other parts of the human body, which require not only more care, but greater exactness and nicer judgment. Very few rules or instructions are requisite upon this head; the best thing the learner can do is, to furnish himself with good prints or drawings by way of examples, and with great care and exactness to copy them. If it is the figure of a beast, begin with the forehead, and draw the nose, the upper and under jaw, and stop at the throat. Then go to the top of the head, and form the ears, neck, back, and continue the line till you have given the full shape of the buttock. Then form the breast, and mark out the legs and feet, and all the smaller parts. And, last of all, finish it with the proper shadows. It is not amiss, by way of ornament, to give a small sketch of landscape; and let it be suitable and natural to the place or country of the beast you draw. Much the same may be said with regard to birds. Of these, as well as beasts and other subjects, the learner will find many examples among the plates given in this publication.

SECT. XII. *Of drawing Landscapes, Buildings, &c.*

Of all the parts of drawing, this is perhaps the most useful and necessary, as it is what every man may have occasion for at one time or another. To be able, on the spot, to take the sketch of a fine building, or a beautiful prospect; of any curious production of art, or uncommon appearance in nature; is not only a very desirable accomplishment, but a very agreeable amusement. Rocks, mountains, fields, woods, rivers, cataracts, cities, towns, castles, houses, fortifications, ruins, or whatsoever else may present itself to view on our journeys or travels in our own or foreign countries, may be thus brought home, and preserved for our future use, either in business or conversation. On this part, therefore, more than ordinary pains should be bestowed.

All drawing consists in nicely measuring the distances of each part of the piece by the eye. In order to facilitate this, let the learner imagine in his own mind, that the piece he copies is divided into squares. For example: suppose or imagine a perpendicular and a horizontal line crossing each other in the centre of the picture you are drawing from; then suppose also two such lines crossing your own copy. Observe in the original, what parts of the design those lines intersect, and let them fall on the same parts of the supposed lines in the copy: we say, the supposed lines; because though engravers, and others who copy with great exactness, divide both the copy and original into many squares; yet this is a method not to be recommended, as it will be apt to deceive the learner, who will fancy himself a tolerable proficient, till he comes to draw after nature, where these helps are not to be had, and then he will perhaps find himself miserably defective in his attempts.

If he is to draw a landscape from nature, let him take his station on a rising ground, where he will have a large horizon; and mark his tablet into three divisions, downwards from the top to the bottom; and divide in his own mind the landscape he is to take, into three divisions also. Then let him turn his face directly opposite to the midst of the horizon, keeping his body fixed, and draw what is directly before his eyes upon the middle division of the tablet; then turn his head, but not his body, to the left hand, and delineate what he views there, joining it properly to what he had done before; and, lastly, do the same by what is to be seen upon his right hand, laying down every thing exactly both with respect to distance and proportion. Some examples are given in Plate 67.

The best artists of late, in drawing their landscapes, make them shoot away one part lower than another. Those who make their landscapes mount up higher and higher, as if they stood at the bottom of a hill to take the prospect, commit a great error: the best way is to get upon a rising ground, make the nearest objects in the piece the highest, and those that are farther off to glance away lower and lower, till they come almost level with the line of the horizon, lessening every thing proportionably to its distance, and observing also to make the objects fainter and less distinct the farther they are removed from the eye. He must make all his lights and shades fall one way, and let every thing have its proper motion: as trees shaken by the wind, the small boughs bending more, and the large ones less: water agitated by the wind, and dashing against ships or boats; or falling from a precipice upon rocks and stones, and spirting up again into the air, and sprinkling all about: clouds also in the air, now gathered with the winds; now violently condensed into hail, rain, and the like: always remembering, that whatever motions are caused by the wind must be made all to move the same way, because the wind can blow but one way at once. Finally, it must be observed, that in order to attain any considerable proficiency in drawing, a knowledge of perspective is absolutely necessary. See the treatise on that subject.

DRAWING, in fox and stag hunting, is a term implying searching for a covert; it being equivalent in this kind of sport, to the term trying for a hare in hare-hunting.

DRA'WINGROOM. *s.* (from *draw* and *room.*) 1. The room in which company assembles at court (*Pope*). 2. The company assembled there.

DRAWN. (participle from *draw.*) 1. Equal; where each party takes his own stake (*Addison*). 2. With a sword drawn (*Shakspeare*). 3. Open; put aside, or unclosed (*Dryden*). 4. Eviscerated (*Shakspeare*). 5. Induced as from some motive (*Spenser*).

DRA'WWELL. *s.* (*draw* and *well.*) A deep well; a well out of which water is drawn by a long cord (*Grew*).

To DRAWL. *v. n.* (from *draw.*) To utter any thing in a slow driveling way (*Pope*).

DRAY. DRA'YCART. *s.* (ꝺꞃaᵹ, Saxon.) The car on which beer is carried (*Gay*).

DRAY. In natural history. A squirrel's deposit for its young; it is built in the angular branches of a tree, and resembles the nest of a magpye.

DRA'YHORSE. *s.* A horse which draws a dray (*Tatler*).

DRA'YMAN. *s.* One that attends a dray or cart (*South*).

DRAYTON, a town in Shropshire, with a market on Wednesdays. Lat. 52. 54 N. Lon. 2. 22 W.

DRAYTON (Michael), an English poet, born in Warwickshire in 1563. He received his education at Oxford, but never took a degree. In 1593 he published a collection of pastorals, entitled, The Shepherd's Garland, which was followed by his poems of The Baron's Wars, and England's Heroical Epistles. In 1613 he published his Poly Olbion, or a Description of England, which is very accurate. He died in 1631, and was buried in Westminster abbey. His works were re-printed in 1748, in one volume folio.

DRA'ZEL. *s.* (from *droslesse*, French.) A low, mean, worthless wench (*Hudibras*).

DREAD. *s.* (ꝺꞃaꝺ, Saxon.) 1. Fear; terrour; affright; horrour (*Tillotson*). 2. Habitual fear; awe (*Genesis*). 3. The person or thing feared (*Prior*).

Dread, says Dr. Cogan, is a degree of permanent fear; an habitual and painful apprehension of some tremendous event, which may be too remote to excite either fear, consternation, or terror. It keeps the mind in a perpetual alarm; in an eager watchfulness of every circumstance that bears any relation to the evil apprehended. It is obvious, that this strong and painful affection cannot be the result or the residue of fear, in the same manner as satisfaction may be the result of joy, and melancholy of the transports of sorrow; because it is not susceptible of a retrospect. When the evil is arrived, the dread of that evil is removed; though the affection may become attached to some pernicious consequences, that may possibly follow. (*Treatise on the Passions, p.* 103).

DREAD. *a.* (ꝺꞃæꝺ, Saxon.) 1. Terrible; frightful (*Milton*). 2. Awful; venerable in the highest degree (*Milton*).

To **DREAD.** *v. a.* (from the noun.) To fear in an excessive degree (*Wake*).

To **DREAD.** *v. n.* To be in fear (*Deut*).

DREA'DER. *s.* One that lives in fear (*Swift*).

DREA'DFUL. *a.* (*dread* and *full*.) 1. Terrible; frightful; formidable (*Granville*). 2. Awful; venerable (*Genesis*).

DREA'DFULLY. *ad.* Terribly; frightfully.

DREA'DFULNESS. *s.* Terribleness; frightfulness (*Hakewill*).

DREA'DLESNESS. *s.* Fearlesness; intrepidity; undauntedness (*Sidney*).

DREA'DLESS. *a.* (from *dread*.) Fearless; unaffrighted; intrepid (*Spenser*).

DREAM. *s.* (*droom*, Dutch.) 1. A phantasm of sleep; the thoughts of a sleeping man (*Dryden*). 2. An idle fancy; a wild conceit (*Shakspeare*).

To **DREAM.** *v. n.* (from the noun.) 1. To have the representation of something in sleep (*Tatler*). 2. To think; to imagine (*Burnet*). 3. To think idly (*Smith*). 4. To be sluggish; to idle (*Dryden*).

To **DREAM.** *v. a.* To see in a dream (*Dry.*).

DREA'MER. *s.* (from *dream*.) 1. One who has dreams (*Locke*). 2. An idle fanciful man; a visionary (*Shakspeare*). 3. A mope; a man lost in wild imagination (*Prior*). 4. A sluggard; an idler.

DREA'MLESS. *a.* Free from dreams (*Camden*).

DREAMS form a most interesting and curious part of the phænomena attending sleep. With respect to these, the three following questions may be proposed. First; what is the state of the mind in sleep? or, in other words, what faculties then continue to operate, and what faculties are then suspended? Secondly; how far do our dreams appear to be influenced by our bodily sensations; and in what respects do they vary, according to the different conditions of the body in health, and in sickness? Thirdly; what is the change which sleep produces on those parts of the body, with which our mental operations are more immediately connected; and how does this change operate, in diversifying, so remarkably, the phenomena which our minds then exhibit, from those of which we are conscious in our waking hours? Of these three questions, the first belongs to the philosophy of the human mind, and is that to which we shall here principally confine ourselves. The second is more particularly interesting to the medical enquirer, and may be considered in another place. (See SLEEP.) The third seems to relate to a subject which is placed beyond the reach of the human faculties.

From very careful and repeated enquiry, it appears, that in dreaming we are not conscious of being asleep: that to a person dreaming, his dreams seem realities: that though it be uncertain whether mankind are all liable to dreams, yet it is well known that they are not all equally liable to dream: that the nature of a person's dreams depends in some measure on his habits of action, and on the circumstances of his life: that the state of the health too, and the manner in which the vital functions are carried on, have a powerful influence in determining the character of a person's dreams: that in sleep and in dreaming, the senses are either absolutely inactive, or nearly so: that such concerns as we have been very deeply interested in during the preceding day, are very likely to return upon our minds in dreams in the hours of rest: that dreams may be rendered prophetic of future events; and therefore, wherever we have such evidence of their having been prophetic as we would accept on any other occasion, we cannot reasonably reject the fact on account of its absurdity; but that they do not appear to have been actually such, in those instances in which the superstition of nations, ignorant of true religion, has represented them as referring to futurity, nor in those instances in which they are viewed in the same light by the vulgar among ourselves: and, lastly, that dreaming is not a phænomenon peculiar to human nature, but common to mankind with the brutes.

According to Wolfe every dream takes its rise from some sensation, and is continued by the succession of phantasms in the mind. His reasons are, that when we dream we imagine something, or the mind produces phantasms; but no phantasm can arise in the mind, without a previous sensation: hence, neither can a dream arise without some previous sensation. He observes farther, that though it be certain *à priori*, from the nature of the imagination, that dreams must begin by some sensation, yet that it is not easy to confirm this by experience; it being often difficult to distinguish those slight sensations, which give rise to dreams, from phantasms, or objects of imagination. Yet this is not impossible in some cases, as when the weak sensation sufficient to give rise to a dream gradually becomes stronger, so as to put an end to it, as it often happens in uneasy and painful sensations. Wolf. Psychol. Empir. § 123.

We have an essay on this subject by M. Formey, in the Mem. de l'Acad. de Berlin. tom. ii. p. 316. He expressly adopts Wolfe's proposition above mentioned, that every dream begins by a sensation, and is continued by a series of acts of imagination, or of phantasms; and that the cause of this series is to be found in the law of the imagination. "Si naturale somnium est, initium capere debet per legem sensationis, et continuari per legem imaginationis." Hence he concludes those dreams to be supernatural, which either do not begin by sensation, or are not continued by the law of the imagination.

This opinion is as ancient as Aristotle, who expressly asserted, that a dream is only the φαντασμα, or appearance of things, arising from the previous motions excited in the brain, and remaining after the objects are removed. Hobbes has adopted this hypothesis: he ascribes different dreams to different distempers of the body, and whimsically enough observes, that lying cold breedeth dreams of fear, and raiseth the thought and image of some fearful object. Thus he accounts for that which was in reality the waking vision of Brutus, which addressed him the night before the battle of Philippi. "I am, Brutus, thine evil genius; but thou shalt see me again near Philippi." And Mr. Locke, though he does not expressly declare how dreams are excited during sleep, seems to ascribe the perfection of rational thinking to the body; and traces their origin to previous sensations, when he says, "The dreams of sleeping men are all made up of the waking man's ideas, though for the most part oddly put together." He urges the incoherence, frivolousness, and absurdity of many of our dreams, as well as by the supposed fact that some sleep without dreaming, as objections to the notion that men think always: so Dr. Hartley explains all the phænomena of the imagination by his theory of vibrations and associations. Dreams, he says, are nothing but the imaginations or reveries of sleeping men, and they are deducible from three causes, viz. the impressions and ideas lately received, and particularly those of the preceding day, the state of the body, and particularly of the stomach and brain, and association. Obs. on Man, vol. i. § 5. p. 383, &c.

Democritus and Lucretius account for dreams, by supposing that spectres and simulacra of corporeal things, constantly emitted from them, and floating up and down in the air, come and assault the soul in sleep. Lucret. De Rer. Nat. lib. iv.

Those who have maintained the essential difference between soul and body have solved the common phænomena of dreams by the union of these two substances, and the necessary connection arising thence between ideas in the mind and certain motions in the body, or in those parts more immediately united to the soul: whilst others, who have denied the existence of matter, account for them in the same manner as for our other ideas, which may not be improperly called waking dreams.

The acute Andrew Baxter affirms, that our dreams are prompted by separate immaterial beings; an opinion which was advanced long ago by the heathens, and maintained very generally, and applied to a species of divination. He contends, that the phantasm, or what is properly called the vision, is not the work of the soul itself, and that it cannot be the effect of mechanical causes; and therefore ascribes it to separate spirits, having access to our minds, and furnishing us with ideas while we sleep. See Mr. Baxter's Essay on the Phæn. of Dreaming, in his Enquiry into the Nature of the human Soul, vol. ii. 3d edit. 1745. This theory, however, notwithstanding the great ingenuity with which it is urged, is far from being plausible. It leads us entirely beyond the limits of our knowledge; requires us to believe without evidence; is unsupported by any analogy; and creates difficulties still more inexplicable than those which it has been proposed for the purpose of removing. Until it appear that our dreams cannot possibly be produced without the interference of other spiritual agents, possessing such influence over our minds as to deceive us with fancied joys, and involve us in imaginary afflictions, we cannot reasonably refer them to such a cause. Besides, from the facts which have been stated as well known concerning dreams, it appears that their nature depends both on the state of the human body and on that of the mind. But, were they owing to the agency of other spiritual beings, how could they be influenced by the state of the body? They must be strange spiritual beings which depend in such a manner on the state of our corporeal frame; it were surely better to deny them existence at all, than to place them in such a dependence.

Professor Dugald Stewart, in endeavouring to deduce principles which shall account for the phænomena of dreams, remarks that in sleep those operations of the mind are suspended, which depend on our volition: he then says, that if the suspension of our voluntary operations in sleep be admitted as a fact, there are only two suppositions which can be advanced concerning its cause. The one is, that the power of volition is suspended; the other, that the will loses its influence over those faculties of the mind, and those members of the body, which, during our waking hours, are subjected to its authority. Now, it may be shewn that the former is not consistent with fact; whence the latter seems to follow as a necessary consequence. Hence it is inferred, that all our mental operations which are independent of our will, may continue during sleep; and that the phænomena of dreaming may, perhaps, be produced by these, diversified in their apparent effects, in consequence of the suspension of our voluntary powers. Two obvious consequences follow: 1. That when we are asleep, the succession of our thoughts, in so far as it depends on the laws of association, may be carried on by the operation of the same unknown causes by which it is produced while we are awake; and 2. that the order of our thoughts, in these two states of our mind, must be very different; inasmuch as in the one, it depends solely on the laws of association; and in the other, on these laws combined with our own voluntary exertions. To evince the agreement of these conclusions with truth, Professor Stewart shews, 1st, that the succession of our thoughts in sleep is regulated by the same general laws of association, to which it is subjected while we are awake; and, 2dly, that the circumstances which discriminate dreaming from our waking thoughts, are such as must necessarily arise from the suspension of the influence of the will. This theory explains very well what many persons think the most mysterious of all the circumstances connected with dreaming, i. e. the inaccurate estimate we form of time, an inaccuracy which often gives to a single instant the appearance of days. The rapidity of thought is at all times such, that, in the twinkling of an eye, a crowd of ideas may pass before us, to which it would require a long discourse to give utterance; and transactions may be conceived, which it would require days to realize. But, in sleep, the conceptions of the mind are mistaken for realities; and therefore our estimates of time will be formed, not according to our experienee of the rapidity of thought, but according to our experience of the time requisite for realizing what we conceive. For a more ample detail of this theory, see Stewart's Elements of the Philosophy of the Human Mind, pp. 328, 348, and note O, pp. 568, 577. See also this subject resumed as connected with other phænomena, and an illustration of Mr. Good's theory as contained in his translation of Lucretius, in the article SLEEP.

DREAR. *a.* (ꝺꞃeoꞃıᵹ, Saxon, dreary.) Mournful; dismal; sorrowful (*Milton*).

DRE'ARIHEAD. *s.* Horrour; dismalness (*Spenser*).

DRE'ARIMENT. *s.* (from *dreary.*) Obsolete. 1. Sorrow; dismalness; melancholy (*Spenser*). 2. Horrour; dread; terrour (*Spenser*).

DRE'ARY. *a.* (ꝺꞃeoꞃıᵹ, Saxon.) 1. Sorrowful; distressful (*Spenser*). 2. Gloomy; dismal; horrid (*Prior*).

DREDGE. *s.* A kind of net (*Carew*).

To DREDGE. *v. a.* To catch with a net (*Carew*).

DRE'DGER. *s.* One who fishes with a dredge.

DRE'GGINESS. *s.* (from *dreggy.*) Fulness of dregs or lees; foulness; feculence.

DRE'GGISH. *a.* (from *dregs.*) Foul with lees; feculent (*Harvey*).

DRE'GGY. *a.* (from *dregs.*) Containing dregs; consisting of dregs; muddy; feculent (*Boyle*).

DREGS. *s.* (ꝺꞃeꞅꞇen, Saxon.) 1. The sediment of liquors; the lees; the grounds; the feculence (*Sandys*). 2. Any thing by which purity is corrupted (*Bacon*). 3. Dross; sweepings; refuse (*Rogers*).

To DREIN. *v. n.* To empty; to drain (*Southern*).

To DRENCH. *v. a.* (ꝺꞃencan, Saxon.) 1. To wash; to soak; to steep (*Milton*). 2. To saturate with drink or moisture (*Shakspeare*). 3. To physic by violence (*Mortimer*).

DRENCH. *s.* (from the verb.) 1. A draught; a swill (*Milton*). 2. Physic for a brute (*Shakspeare*). 3. Physic that must be given by violence (*K. Charles*). 4. A channel of water.

DRENCH, or DRINK. Any medical composition prepared in a liquid form, and given to horses or cattle for the cure of diseases. Some distinction, however, is generally made between these two terms, it being the custom to say, drink for a horse, drench for a cow. They are given with a horn, sold by saddlers and collar-makers for this purpose.

DRE'NCHER. *s.* (from *drench.*) 1. One that dips or steeps any thing. 2. One that gives physic by force.

DRENT. *participle.* Drenched. (*Spenser*).

DRESDEN, a town of Germany, and capital of Saxony. It is divided by the Elbe into the Old and New Town, which are joined together by a bridge 685 paces long. Both towns are surrounded by strong fortifications: however, it was taken by the king of Prussia in 1745, but was soon restored, in consequence of a peace between him and the then elector. All the houses are built of free-stone, and are almost all of the same height. There is a magnificent church for the Roman Catholics, which stands between the Elbe, the bridge, and the castle; and there are so many palaces, that it is one of the handsomest cities in Germany. Before the place where they keep guard, in the New Town, is an equestrian statue of Augustus II. looking toward Poland. Lat. 51. 0 N. Lon. 13. 50 E.

To DRESS. *v. a.* (*dresser*, French.) 1. To clothe; to invest with clothes (*Dryden*). 2. To clothe pompously or elegantly (*Taylor*). 3. To adorn; to deck; to embellish (*Clarendon*). 4. To cover a wound with medicaments (*Wiseman*). 5. To curry; to rub a horse (*Taylor*). 6. To rectify; to adjust (*Milton*). 7. To prepare for any purpose (*Mortimer*). 8. To trim; to fit any thing for ready use (*Mortimer*). 9. To prepare victuals for the table (*Dryden*).

DRESS. *s.* (from the verb.) 1. Clothes; garment; habit (*Gov. of Tongue*). 2. Splendid clothes; habit of ceremony (*Clari.*). 3. The skill of adjusting dress (*Pope*).

DRE'SSER. *s.* (from *dress.*) 1. One employed in putting on the clothes and adorning the person of another (*Dryden*). 2. One employed in regulating, trimming, or adjusting any thing (*Luke*). 3. The bench in a kitchen on which meat is drest or prepared for the table (*Swift*).

DRE'SSING. *s.* (from *dress.*) The application made to a sore (*Wiseman*).

DRE'SSINGROOM. *s.* The room in which clothes are put on (*Swift*).

DREST. *part.* (from *dress.*)

DREUX, a town in the department of Eure and Loire, and late province of Beauce, in France. It has a large manufacture of cloth. Lat. 48. 44. N. Lon. 1. 26 E.

To DRIB. *v. a.* To crop; to cut off (*Dryden*).

To DRI'BBLE. *v. n.* (from *drip.*) 1. To fall in drops (*Woodward*). 2. To fall weakly and slowly (*Shakspeare*). 3. To slaver as a child or ideot.

To **Dri'bble.** *v. a.* To throw down in drops (*Swift*).

DRI'BLET. *s.* (from *dribble.*) A small sum; odd money in a sum (*Dryden*).

DRI'ER. *s.* (from *dry.*) That which has the quality of absorbing moisture; a desiccative (*Bacon*).

DRIFT. *s.* (from *drive.*) 1. Force impellent; impulse (*South*). 2. Violence; course (*Spenser*). 3. Any thing driven at random (*Dryden*). 4. Any thing driven or born along in a body (*Pope*). 5. A storm; a shower (*Shakspeare*). 6. A heap or stratum of any matter thrown together by the wind. 7. Tendency, or aim of action (*Daniel*). 8. Scope of a discourse (*Tillotson*).

To **Drift.** *v. a.* (from the noun.) 1. To drive; to urge along (*Ellis*). 2. To throw together on heaps (*Thomson*).

Drift, Shoot, or **Thrust** of an arch, the push or force which it exerts in the direction of the length of the bridge. It arises from the gravitation of the stones of the arch, which, being kept from descending by the cohesion of the arch, and the resistance of the pier, exert their force in a lateral or horizontal direction. This force is the greater as the arch is lower, *cæteris paribus.*

Drift, in the veterinary vocabulary, the act of driving a common: a ceremony which takes place once, twice, or thrice a year (according to the custom of the place), to insure and continue the privilege of the lord of the manor, as well as to preserve the rights of the parishioners. The cattle upon the commons and wastes being all driven to some particular spot, are there examined, and their owners ascertained: those belonging to parishioners (or such as have right of common) are immediately liberated, and return to their former pasturage; the rest being the property of aliens, are impounded, and the owner is fined such sum as may be thought equitable by the bailiff of the manor. No owner being found, the beast (whatever it be) is called an estray; it is usually cried three times in the nearest market-towns, and if not claimed within twelve months and a day, becomes the property of the lord of the manor. This is usually called *drift of the forest*; though it as often takes place upon manors where there is no forest, as where the whole is forest land.

Drift, in mining, a passage cut out under the earth, betwixt shaft and shaft, or turn and turn; or a passage or way wrought under the earth, to the end of a meer of ground, or part of a meer.

Drift, in navigation, the angle which the line of a ship's motion makes with the nearest meridian, when she drives with her side to the wind and waves, and is not governed by the power of the helm; it also implies the distance which the ship drives on that line. A ship's way is only called drift in a storm; and when it blows so vehemently as to prevent her from carrying any sail, or at least restrains her to such a portion of sail as may be necessary to keep her sufficiently inclined to one side, that she may not be dismasted by the violent labouring produced by the turbulence of the sea.

Drift-sail, a sail used under water, veered out right ahead by sheets, as other sails are. It serves to keep the ship's head right upon the sea in a storm, and to hinder her driving too fast in a current.

To DRILL. *v. a.* (*drillen,* Dutch.) 1. To pierce any thing with a drill (*Moxon*). 2. To perforate; to bore; to pierce (*Blackmore*). 3. To make a hole (*Moxon*). 4. To delay; to put off (*Addison*). 5. To draw from step to step (*South*). 6. To drain; to draw slowly (*Thomson*). 7. To form to arms (*Hudibras*).

Drill. *s.* (from the verb.) 1. A pointed instrument with which holes are bored (*Boyle*). 2. An ape; a baboon (*Locke*). 3. A small dribbling brook; a rill (*Sandys*).

Drill, in mechanics, a small instrument for making such holes as punches will not conveniently serve for. Drills are of various sizes, and are chiefly used by smiths, turners, carpenters, and coopers.

Drill, or **Drill-box,** a name given to an instrument for sowing land in the new method of horse-hoeing husbandry.

Drill-sowing, a method of sowing grain or seed of any kind, so that it may all be at a proper depth in the earth, which is necessary to its producing healthful and vigorous plants. For this purpose a variety of drill-ploughs have been invented and recommended; but partly from the expence attending the purchase, partly from the complication of their structure, and partly from the attachment of the illiterate farmer to long habits, these excellent schemes for diminishing labour have not received that share of encouragement to which they seem entitled. See **Husbandry.**

DRIMA. In botany, a genus of the class hexandria, order monogynia. Corol inferior, campanulate, six-cleft, with revolute segments; stamens inserted on the corol; stigma capitate. Five species, all Cape plants, with white or greenish flowers, generally nodding.

To DRINK. *v. n.* pret. *drank,* or *drunk*; part. pass. *drunk* or *drunken.* (ꝺꞃıncan, Sax.) 1. To swallow liquors; to quench thirst (*Tay*). 2. To be entertained with liquors (*Shakspeare*) 3. To be an habitual drunkard. 4. *To* **Drink** *to.* To wish well to in the act of taking the cup (*Shakspeare*).

To **Drink.** *v. a.* 1. To swallow: applied to liquids (*South*). 2. To suck up; to absorb (*Gay*). 3. To take in by an inlet; to hear; to see (*Pope*). 4. To act upon by drinking (*South*). 5. To make drunk (*Kings*).

Drink. *s.* (from the verb.) Liquor to be swallowed (*Milton*). 2. Liquor of any particular kind (*Philips*).

DRINK-MONEY. *s.* Money given to buy liquor (*Arbuthnot*).

DRI'NKABLE. *a.* (from *drink.*) Potable.

DRI'NKER. *s.* (from *drink.*) One that drinks to excess; a drunkard (*South*).

DRINKING, is one of the animal functions, essential to the proper solution and digestion of food. Although the proportion of liquid to that of dry or solid food cannot be precisely ascertained; yet, if the constant secretion of fluids be laid down as the basis of this computation, we should, perhaps, drink double the quantity of the solid provisions we daily consume. Nevertheless, even this proportion is but too often exceeded, merely to please the artificial cravings of a corrupted palate. Thus, we no longer drink with a view to quench thirst only, but at certain hours of the day, whether we are naturally inclined, or not. Nay, we frequently meet with sots in beer, ale, spirits, wine, punch, and even tea. Excessive drink, however, though it distend and oppress the stomach, and thus impede digestion, is not nearly so pernicious as gluttony, unless the former be attended with intoxication. It however impoverishes the whole mass of the blood, by rendering it too thin and watery; so that relaxation of the urinary and other canals, at length, general debility of the system, are its necessary concomitants.

On the contrary, too little drink disposes persons of a sedentary life to indigestion; because many particles of solid food are, for want of dilution, passed unassimilated through the alimentary canal; and the blood becomes viscid, and inert in its circulation. The active and laborious should, therefore, drink more than the idle or phlegmatic; and either of these more in summer than in winter, to supply the great loss of humours exhaled by insensible perspiration.

Persons whose natural appetite is not depraved in consequence of irregular living, may easily regulate the due proportion of their drink to that of dry aliment; as, to them, thirst will be the safest guide. But those individuals who have become slaves to the libations of Bacchus are unfortunately deprived of this beneficent instinct, which is the privilege even of irrational animals.

If the moral turpitude of committing excess in drinking affords no argument to induce the habitual votary to abstain from such pernicious practice, we shall only add, that he will sooner or later feel the effects of it in painful and lingering sickness. But reasoning is in vain with those who can deliberately and habitually "take an enemy down their throat to steal away their brains;" and it is useless to expect that words should reach the consciences of those who are seared by the drinking of liquid fire. We would just venture to remind those who are comparatively moderate, that large potations are, at all times, and in every constitution, improper; that they are particularly injurious when indulged in previously to the taking of food, and especially before dinner; that all beverage is more pernicious to the healthy in a warm than in a cold state; that the human stomach should never be inundated with immoderate quantities of drink at one time; and that the most natural drink, and the most conducive to health, without exception, is pure water.

DRINO, a seaport town of European Turkey, seated on a bay of the same name. Lat. 42. 20 N. Lon. 19. 19 E.

To DRIP. *v. n.* (*drippen*, Dutch.) 1. To fall in drops. 2. To have drops falling from it (*Prior*).

To Drip. *v. a.* 1. To let fall in drops (*Swift*). 2. To drop fat in roasting (*Walton*).

Drip. *s.* That which falls in drops (*Mortimer*).

Drip, in architecture. See Corona.

DRI'PPING. *s.* (from *drip.*) The fat which housewives gather from roast meat (*Swift*).

DRI'PPINGPAN. *s.* The pan in which the fat of roast meat is caught (*Swift*).

To DRIVE. *v. a* pret. *drove*, ancienly *drave*; part. pass. *driven*, or *drove*. (ꝺꞃıꝼan, Saxon.) 1. To produce motion in any thing by violence: as, the hammer *drives* the nail. 2. To force along by impetuous pressure (*Pope*). 3. To expel by force from any place (*Dryden*). 4. To force or urge in any direction (*Hab.*). 5. To guide and regulate a carriage (*Exodus*). 6. To make animals march along under guidance (*Addison*). 7. To clear any place by forcing away what is in it (*Dryden*). 8. To force; to compel (*Ascham*). 9. To distress; to straiten (*Spenser*). 10. To urge by violence, not kindness (*Dryden*). 11. To impel by influence of passion (*Clarendon*). 12. To urge; to press to a conclusion (*Digby*). 13. To carry on; to keep in motion (*Bacon*). 14. To purify by motion (*L'Estr.*). 15. To Drive *out.* To expel (*Knolles*).

To Drive. *v. n.* 1. To go as impelled by any external agent (*Brown*). 2. To rush with violence (*Dryden*). 3. To pass in a carriage (*Milton*). 4. To tend to; to consider as the scope and ultimate design (*Locke*). 5. To aim; to strike at with fury (*Dryden*).

To DRI'VEL. *v. n.* (from *drip.*) 1. To slaver; to let the spittle fall in drops, like a child or ideot (*Grew*). 2. To be weak or foolish; to dote (*Shakspeare*).

Dri'vel. *s.* (from the verb.) 1. Slaver; moisture shed from the mouth (*Dryden*). 2. A fool; a driveller: out of use (*Sidney*).

DRI'VELLER. *s.* (from *drivel*). A fool; an ideot; a slaverer (*Swift*).

DRI'VEN. The participle of *drive.*

DRI'VER. *s.* (from *drive.*) 1. The person or instrument who gives any motion by violence. 2. One who drives beasts (*Sandys*). 3. One who drives a carriage (*Dryden*).

DRIVING, among sportsmen, a method of taking pheasant-powts. It is thus practised: The sportsman finds out the haunts of these birds; and having fixed his nets there, he calls many of them together by a pheasant-call, imitating the voice of the dam; after this he makes a noise with his driver, which will make them run a little way forward in a cluster; and this he is to repeat till he has secured them.

which an expert sportsman never fails to do, by driving them into his nets.

Driving, in metallurgy, is said of silver, when, in the operation of refining, the lead being burnt away, the remaining copper rises upon its surface in red fiery bubbles.

Driving, in the sea-language, is said of a ship, when an anchor being let fall will not hold her fast, nor prevent her sailing away with the wind or tide. The best way in this case is to let fall more anchors, or to veer out more cable; for the more cable she has out, the safer she rides. When a ship is a-hull or a-try, they say she drives to leeward.

To **DRI'ZZLE.** *v. a.* (*drisleu*, German) To shed in small slow drops (*Shakspeare*).

To **Dri'zzle.** *v. n.* To fall in short slow drops (*Addison*).

DRI'ZZLY. *a.* (from *drizzle.*) Shedding small rain (*Dryden*).

DROGHEDA, or **Tredah**, a sea-port town and the capital of Louth in Ireland. In 1649 Oliver Cromwell stormed and took it, when about 4,000 men, found in arms in it, were put to the sword. It sends 2 members to parliament, and is 23 miles N. of Dublin. Lat. 51. 53 N. Lon. 6. 1 W.

DROIL. *s.* A drone; a sluggard.

To **Droil.** *v. n.* To work sluggishly and slowly; to plod (*Government of the Tongue*).

DROIT, *jus*, signifies right or law, of which some distinguish six kinds: 1. Jus recuperandi, right of recovery. 2. Jus entrandi, right of entering. 3. Jus habendi, right of having. 4. Jus retinendi, right of retaining. 5. Jus percipiendi, right of receiving. 6. Jus possidendi, right of possessing.

Droit is also the highest of all real writs; and takes its name of a writ of right from the greatest regard being shown to it, and as it has the most assured and final judgment. There are several sorts of these writs used in our law, as droit de avowson, droit de dower, droit de garde, droit patent, droit rationabili parte, and droit sur disclaimer.

DROITWICH, a town of Worcestershire, in England, noted for excellent white salt, made from the salt springs in its neighbourhood. It sends two members to parliament. Lat. 52. 15 N. Lon 1. 48 W.

DROLL. *s.* (*droler*, French.) 1. One whose business it is to raise mirth by petty tricks; a jester; a buffoon (*Prior*). 2. A farce; something exhibited to raise mirth (*Swift*).

To **Droll.** *v. n.* (*drôle*, French.) To jest; to play the buffoon (*Glanville*).

DRO'LLERY. *s.* (from *droll.*) Idle jokes; buffoonery (*Government of the Tongue*).

DROMEDARY, in mastiology. See **Camelus.**

DROMONES, in antiquity, a kind of yachts. Those who rowed them were called Dromonarii.

DROMORE, a town of Ireland, in the county of Down, and the see of a bishop. Lat. 54. 25 N. Lon. 6. 8 W.

DRONE. *s.* (ꝺꞃoen, Saxon.) (See **Apis** and **Bee.**) 1. The bee which makes no honey (*Dryden*). 2. A sluggard; an idler (*Addison*). 3. The hum, or instrument of humming.

Drone. The greatest tube of the bag-pipe: the office of which is to emit one continued deep note, as an accompanying bass to the air or tune played on the smaller pipes.

To **Drone.** *v. n.* (from the noun.) 1. To live in idleness; to dream (*Dryden*). 2. To give a heavy dull tone (*Dryden*).

DRONFIELD, a town in Derbyshire, with a market on Thursdays. It is situated at the edge of the Peak, in a very wholesome air. Lat. 53. 18 N. Lon. 1. 25 W.

DRO'NISH. *a.* (from *drone.*) Idle; sluggish; lazy; indolent; unactive (*Dryden*).

DRONTE, in ornithology. See **Dodo.**

DRONTHEIM, a city of Norway, capital of a government of the same name, with an archbishop's see, and a good harbour. Lat. 63. 26 N. Lon. 11. 9 E.

To **DROOP.** *v. n.* (*droef*, sorrow, Dutch.) 1. To languish with sorrow (*Sandys*). 2. To faint; to grow weak (*Roscommon*). 3. To sink; to lean downward (*Pope*).

DROOPING (cernuus). In botany. The top or end pointing to the ground. Applied to the peduncle or flower; as in bidens cernua. Different from nodding, **Nutans**; which see.

DROP. *s.* (ꝺꞃoppa, Saxon.) 1. A globule of moisture; as much liquor as falls at once when there is not a continual stream (*Boyle*). 2. Diamonds hanging in the ear (*Pope*).

Drop serene. *s.* (*gutta serena*, Latin.) A disease of the eye, proceeding from an inspissation of the humour (*Milton*).

To **Drop.** *v. a.* (ꝺꞃoppan, Saxon.) 1. To pour in drops or single globules (*Deuteronomy*). 2. To let fall (*Dryden*). 3. To let go; to dismiss from the hand, or the possession (*Watts*). 4. To utter slightly or casually (*Amos*). 5. To insert indirectly, or by way of digression (*Locke*). 6. To intermit; to cease (*Collier*). 7. To quit a master (*L'Estr.*). 8. To let go a dependant, or companion, without further association (*Addison*). 9. To suffer to vanish, or come to nothing (*Swift*). 10. To bedrop; to speckle; to variegate with spots (*Milton*).

To **Drop.** *v. n.* 1. To fall in drops, or single globules (*Shakspeare*). 2. To let drops fall (*Psalms*). 3. To fall; to come from a higher place (*Cheyne*). 4. To fall spontaneously (*Milton*). 5. To fall in death; to die suddenly (*Shakspeare*). 6. To die (*Digby*). 7. To sink into silence; to vanish; to come to nothing (*Addison. Pope*). 8. To come unexpectedly (*Spectator*).

DRO'PPING. *s.* (from *drop.*) 1. That which falls in drops (*Donne*). 2. That which drops when the continuous stream ceases (*Pope*).

DRO'PLET. *s.* A little drop (*Shakspeare*).

DROPS, in architecture. See **Guttæ** and **Tryglyph.**

Drops. See **Medicine** and **Pharmacy.**

DRO'PSICAL. *a.* (from *dropsy.*) Diseased with a dropsy; tending to a dropsy (*Arbuthnot*).

DRO'PSIED. *a.* (from *dropsy.*) Diseased with a dropsy (*Shakspeare*).

DROPSY. (Hydrops, from ὕδωρ, water.) In medicine. See the different species of this disease, ASCITES and ANASARCA: see also MEDICINE.

DRO'PWORT. See SPIRÆA.

DROPWORT (Water). See OENANTHE.

DRO'SERA. Sun-dew. In botany, a genus of the class pentandria, order pentagynia. Calyx five-cleft; petals five; capsule one celled, three or five valved; seeds numerous. Eleven species; chiefly Cape or Indian plants: but three common to the bogs and ditches of our own country: of these the sun-dew of the dispensatories is d. rotundifolia, with orbicular, radical, depressed leaves, with hairy petioles; scapes and calyxes hairy. The orbicular radical leaves which resemble a cup are fringed with hair, and secrete a limpid fluid, which has all the appearance of a dew-drop, and which is so constantly supplied, that the cup is never dried up or exhausted during the hottest day; whence the name sun-dew. The whole plant is extremely acrid, and the juice that exudes from its broken stem is sufficiently caustic to corrode the skin; whence, mixed with milk, it is often used as a cosmetic.

DROSS *s.* (ꝺꞃoꞅ, Saxon.) 1. The recrement or despumation of metals (*Hooker*). 2. Rust; incrustation upon metal (*Addison*). 3. Refuse; leavings; sweepings; dregs; feculence; corruption (*Tillotson*).

DRO'SSINESS. *s.* (from *drossy.*) Foulness; feculence; rust (*Boyle*).

DRO'SSY. *a.* (from *dross.*) 1. Full of scorious or recrementitious parts; full of dross (*Davies*). 2. Worthless; foul; feculent (*Donne*).

DRO'TCHEL. *s.* An idle wench; a sluggard.

DROVE. *s.* (from *drive.*) 1. A body or number of cattle (*Hayward*). 2. A number of sheep driven (*South*). 3. Any collection of animals (*Milt.*). 4. A crowd; a tumult (*Dry.*).

DRO'VEN. *part.* from *drive:* not used (*Shakspeare*).

DRO'VER. *s.* He who is employed to drive cattle from one place to another, to sell.

DROUGHT. *s.* (ꝺꞃuᵹoꝺe, Saxon.) Dry weather; want of rain (*Sandys*). 2. Thirst; want of drink (*Milton*).

DROU'GHTINESS. *s.* (from *droughty.*) The state of wanting rain.

DROU'GHTY. *a.* (from *drought.*) 1. Wanting rain; sultry (*Ray*). 2. Thirsty; dry with thirst (*Philips*).

To DROWN. *v. a.* (ꝺꞃuncnian, Saxon.) 1. To suffocate in water (*King Charles*). 2. To overwhelm in water (*Knolles*). 3. To overflow; to bury in an inundation; to deluge (*Dryden*). 4. To immerge; to lose in any thing (*Davies*). 5. To lose in something that overpowers or covers (*Wotton*).

To DROWN. *v. n.* To be suffocated in the water (*Ascham*).

DROWNING, signifies the extinction of life by a total immersion in water. In some respects there seems to be a great similarity between the death occasioned by immersion in water, and that by strangulation, suffocation by fixed air, apoplexies, epilepsies, sudden faintings, violent shocks of electricity, or even violent falls and bruises. Physicians, however, are not agreed with regard to the nature of the injury done to the animal system in any or all of these accidents. It is indeed certain, that in all the cases above mentioned, particularly in drowning, there is very often such a suspension of the vital powers as to us hath the appearance of a total extinction of them; while yet they may be again set in motion, and the person restored to life, after a much longer submersion than has been generally thought capable of producing absolute death. The length of time during which a person may remain in water without being drowned, is very unequal in different individuals; and depends as much on the temperature of the water as on the particular constitution of the subject: in general, however, there is less prospect of recovery, after having continued fifteen minutes immersed in water. In such cases, death ensues from impeded respiration, and the consequent ceasing of the circulation of the blood, by which the body loses its heat, and, with that, the activity of the vital principle. Dr. Goodwyn justly observes, that the water produces all the changes which take place in drowning, only indirectly, by excluding the atmospheric air from the lungs, as they admit but a very inconsiderable quantity of fluid to pass into them, during immersion. Hence we shall find, in the progress of this inquiry, that inflation of the lungs is one of the principal means of restoring life.

Before we describe the various methods that have been successfully adopted, for recovering drowned persons, it will be useful to advert (on the plan of Dr. Struve) to those circumstances which deserve to be duly weighed, previously to any active measures being taken on such unfortunate occasions: 1. The season and weather. 2. Length of time the person has continued under water. 3. The state of his mind when the accident happened: whether he was intoxicated, frightened, &c. 4. Constitution of the body, and whether he was in a state of perspiration. 5. The height from which he fell, and whether his head plunged foremost. 6. Depth of the water; whether it was cold or warm, sea or river water, and how he was dressed. Lastly, 7. The manner in which he was taken out, whether by the legs, and without receiving any injury, or by instruments; and whether he was rolled about in a tub, or what other methods were pursued for his restoration.

Few improvements appear to have been made in the treatment of the drowned, since this important branch of medical science was first discussed, in a popular manner, by the late Dr. Tissot; yet the names of Cullen, Goodwyn, Cogan, Hawes, and Coleman, in Britain, as well as those of Unzer, Reimarus, and Struve, in Germany, deserve to be respectfully mentioned: from their various publications, and especially of the two last mentioned, we shall briefly state the principal rules of conduct to be observed, with respect to persons in that deplorable situation.

Symptoms of Apparent Death by Drowning.—Coldness; paleness of the whole body; the lips of a livid hue; the mouth either open or firmly closed; the tongue blue, swelled and protruded; the eye-lids closed, the eyes turned, and their pupils dilated; the face swelled and blue; the lower belly hard and inflated. The first signs of returning animation are, convulsive starting of the muscles of the face, or feet; motion of the eye-lids; a spasmodic shivering of the body.

Treatment.— 1. After having been carefully taken out of the water by the arms, so as to prevent the least injury to the head and breast, the body ought to be carried to the nearest house (if possible, on a bier), with the head somewhat raised; or, in fine warm weather, the resuscitative process may with more advantage be performed in the open air, especially in sun-shine.

2. When the subject is deposited, the upper part of the body should be supported half-sitting, with the head inclining towards the right side.

3. The clothes are to be taken off without delay, but with the greatest precaution; as violent shaking of the body might extinguish the latent spark of life.

4. The mouth and nose must be cleansed from the mucus and froth, by means of a feather dipped in oil.

5. The whole body should now be gently wiped and dried with warm flannel cloths, then covered with blankets, feather-beds, hay, straw, &c. In cold or moist weather, the patient is to be laid on a mattress or bed, at a proper distance from the fire, or in a room moderately heated; but in the warm days of summer, a simple couch is sufficient.

6. If the patient be very young, or a child, it may be placed in bed between two persons, to promote natural warmth.

7. In situations where the bath cannot be conveniently procured, bladders filled with lukewarm water should be applied to different parts of the body, particularly to the pit of the stomach; or a warming-pan wrapped in flannel gently moved along the spine; or aromatic fomentations frequently and cautiously repeated.

8. As the breathing of many persons in an apartment would render the air mephitic, and thus retard, or even prevent the restoration of life, not more than five or six assistants should be suffered to remain in the room where the body is deposited.

Stimulants generally employed.—1. Moderate friction with soft, warm flannel, at the beginning, and gradually increased by means of brushes dipped in oil, till pulsations of the heart are perceptible.

2. Inflation of the lungs, which may be more conveniently effected by blowing into one of the nostrils, than by introducing air into the mouth. For the former purpose, it is necessary to be provided with a wooden pipe, fitted at one extremity for filling the nostril, and at the other for being blown into by a healthy person's mouth, or for receiving the muzzle of a pair of common bellows, by which the operation may be longer continued. At first, however, it will always be more proper to introduce the warm breath from the lungs of a living person, than to commence with cold atmospheric air. During this operation, the other nostril and the mouth should be closed by an assistant, while a third person gently presses the chest with his hands, as soon as the lungs are observed to be inflated.

3. Stimulating clysters, consisting of warm water and common salt; or a strong solution of tartar emetic; or decoctions of aromatic herbs; or six ounces of brandy, should be speedily administered. We do not consider injections of the smoke of tobacco, or even clysters of that narcotic plant, in all instances safe or proper.

4. Let the body be gently rubbed with common salt, or with flannels dipped in spirits; the pit of the stomach fomented with hot brandy; the temples stimulated with spirit of hartshorn; and the nostrils occasionally tickled with a feather.

5. Persons of a very robust frame, and whose skin after being dried assumes a rigid and contracted surface, may be put into the sub-tepid bath, of about 65°, which must be gradually raised to 75° or 80° of Fahrenheit's scale, according to circumstances; or the body carried to a brewhouse, and covered with warm grains for three or four hours: but these expedients generally require medical assistance.

6. Violent shaking and agitation of the body by the legs and arms, though strongly recommended, and supposed to have often forwarded the recovery of children and boys, appears to us a doubtful remedy, which can be practised only in certain cases.

7. Sprinkling the naked body of a drowned person with cold water; submitting it to the operation of a shower-bath, or the sudden shocks of the electric fluid; as well as whipping it with nettles, administering emetics, and blood-letting, are desperate expedients, which should be resorted to only after the more lenient means have been unsuccessfully employed.

It is, however, a vulgar and dangerous error, to suppose that persons apparently dead by immersion under water are irrecoverable, because life does not soon re-appear: hence we seriously intreat those who are thus employed in the service of humanity to persevere for three or four hours at least, in the application of the most appropriate remedies above described; for there are many instances recorded, of patients who recovered, after they had been relinquished by all their medical and other assistants.

Treatment on the Return of Life.—As soon as the first symptoms of that happy change become discernible, additional care must be taken to cherish the vital action, by the most soothing means. All violent proceedings should, therefore, be immediately abandoned, no farther stimulants applied, nor even the ears of the patient be annoyed by loud speaking, shouting, &c. At that important crisis, moderate friction only is requisite. And, if the reviving person happen to be in the bath, he may either remain there, provided his sensations be easy and agreeable, or be removed to a comfortable bed, after being expeditiously dried with warm flannels: fomentations of aromatic plants may then be applied to the pit of the stomach; bladders filled with warm water, placed to the left side; the soles of the feet rubbed with salt; the mouth cleared of froth and mucus, and a little white wine, or a solution of salt in water, dropped on the tongue. But all strong stimulants, such as powerful electric shocks, strong odours of volatile salts, &c. are at this period particularly injurious. Lastly, the patient, after resuscitation, ought to be for a short interval resigned to the efforts of nature, and left in a composed and quiescent state: as soon as he is able to swallow, without compulsion or persuasion, warm wine, or tea, with a few drops of vinegar, instead of milk, or gruel, warm beer, and the like, should be given in small doses frequently repeated.

We cannot conclude this subject without affording the reader a view of the different articles belonging to a complete chest of instruments, and other materials, employed in the various processes for recovering suspended animation from drowning. The merit of these institutions in England is due to Drs. Cogan and Hawes, the founders of the Royal Humane Society at London; but the improved arrangement of the chest now to be described, together with the choice of internal and external remedies, were made by a respectable surgeon at Deptford, Mr. Kite, in 1788, though considerably extended in 1790, by Mr. Redlich, a medical practitioner of respectability at Hamburgh. This gentleman is likewise one of the most active members of the Humane Society in that city, and has offered the following articles for sixty-five marks, or about four guineas and a half. His complete chest contains:

A small bottle of rectified spirit of wine.
Ditto, white-wine vinegar.
Ditto, sweet oil.
Ditto, white French brandy.
Ditto, volatile sal ammoniac.
Ditto, vitriolic æther.
Ditto, mustard-seed.

A machine for injecting the smoke of tobacco.

A leather tube, together with a pair of bellows, for inflating the lungs

Another tube of leather, for introducing medicines into the stomach.

A small syringe for clearing the throat of mucus.

Three woollen covers or blankets.

Four brushes, and six woollen cloths, for performing friction.

Several emetics.

Two lancets for blood-letting.

One pound of tobacco.

A roller and cushion, to be used in venæsection.

Two quills, a sponge, and some lint.

A pocket-knife.

An apparatus for striking fire.

Chamomile and elder-flowers.

Common salt: — and a printed copy of rules and directions for treating the drowned.

Conceiving that a chest containing all these articles could not be purchased in London for less than double the price above stated, beside the additional trouble of procuring them, we have borrowed this account from our respectable fellow-labourer, the editor of the Domestic Encyclopædia.

To DROWSE. *v. a.* (*droosen*, Dutch.) To make heavy with sleep (*Milton*).

To Drowse. *v. n.* 1. To slumber; to grow heavy with sleep (*Milton*). 2. To look heavy, not cheerful (*Shakspeare*).

DRO'WSIHED. *s.* Sleepiness; inclination to sleep: obsolete (*Spenser*).

DRO'WSILY. *ad.* (from *drowse.*) 1. Sleepily; heavily (*Dryden*). 2. Sluggishly; idly; slothfully; lazily (*Raleigh*).

DRO'WSINESS. *s.* (from *drowse.*) 1. Sleepiness; heaviness with sleep (*Crashaw*). 2. Idleness; indolence; inactivity (*Bacon*).

DRO'WSY. *s.* (from *drowse.*) 1. Sleepy; heavy with sleep; lethargic (*Dryden*). 2. Heavy; lulling; causing sleep (*Addison*). 3. Stupid; dull (*Atterbury*).

To DRUB. *v. a.* (*druber*, to kill, Dan.) To thrash; to beat; to bang (*Hudibras*).

Drub. *s.* (from the verb.) A thump; a knock; a blow (*Addison*).

To DRUDGE. *v. a.* (*draghen*, to carry, Dutch.) To labour in mean offices; to toil without honour or dignity; to work hard (*Otway*).

Drudge. *s.* (from the verb.) One employed in mean labour; a slave (*Shakspeare*).

DRU'DGER. *s.* (from *drudge.*) 1. A mean labourer. 2. The drudging-box.

DRU'DGERY. *s.* Mean labour; ignoble toil; servile occupation (*Southern*).

DRU'DGING-BOX. *s.* The box out of which flour is sprinkled upon roast meat (*King*)

DRU'DGINGLY. *ad.* Laboriously; toilsomely.

DRUG. *s.* (*drogue*, French.) 1. An ingredient used in physic; a medicinal simple. (See Materia Medica, Pharmacy, &c.) 2. Any thing without worth or value; any thing of which no purchaser can be found (*Dryden*). 3. A drudge (*Shakspeare*).

To Drug. *v. a.* (from the noun.) 1. To season with medicinal ingredients (*Shakspeare*). 2. To tincture with something offensive (*Milton*).

DRUGGET, in commerce, a sort of stuff, very thin, and narrow, sometimes all wool, and sometimes half wool, and half thread; having sometimes the wale, but more usually without.

DRU'GGIST. *s.* (from *drug.*) One who sells physical drugs (*Boyle*).

DRU'GSTER. *s.* (from *drug.*) One who sells physical simples (*Atterbury*).

DRUIDS, Druides, or Druidæ, the priests or ministers of religion among the ancient Celtæ or Gauls, Britons, and Germans. Some authors derive the word from the Hebrew דרשים *derussim*, or *drussim*, which they translate *contemplatores*. Picard, Celtopæd. lib. ii. p. 58, believes the Druids to have been thus called from Druis, or Dryius, their leader, the fourth or fifth king of the Gauls, and father of Saron or Naumes. Pliny, Salmasius, Vigenere, &c. derive the name from δρυς, oak; on account of their inhabiting, or at least frequenting, and teaching in forests; or perhaps because, as Pliny says, they never sacrificed but under the oak. But it is hard to imagine how the Druids should come to speak Greek. Menage derives the word from the old British *drus*, dæmon, magician. Borel, from the Saxon *dry*, magician; or rather from the old British *dru*, or *deru*, oak, whence he takes δρυς to be derived; which is the most probable supposition.

The Druids were the first and most distinguished order among the Gauls and Britons; they were chosen out of the best families; and the honours of their birth, joined with those of their function, procured them the highest veneration among the people. The authority of the kings of Britain was greatly controuled by the Druids, who were not only the ministers of religion, but also possessed the right of making laws, of explaining and executing them. Their power, and consequently the honour paid them, was incredibly great. They were considered as the interpreters of the gods; they were exempted from all taxes and military services; and their persons were held sacred and inviolable. They were objects of such veneration, that the rage of hostile armies about to engage was not only suspended, but entirely suppressed, by their interposition. (Diodor. v. 31. Strab. iv. 197.) There was a chief Druid chosen by the suffrages of the rest; which was an office of so great dignity, that the appointment to it was sometimes determined by arms. The chief residence of the Archdruid of Gaul was at Dreux, in Pais Chartrain (*in finibus Carnutum, quæ regio totius Galliæ media habebatur*), whither all those who had law-suits came to get them determined. (Cæsar, vi. 13.) The Archdruid of Britain resided, as it is thought, in the island of Anglesey (*in Mona*), where the vestiges of his palace, and of the houses of the other Druids, who attended him, are said still to be visible. (Rowland's Mona Antiqua.) We know but little as to their peculiar doctrines; only that they believed the immortality of the soul; and, as is generally supposed, the metempsychosis; though a late author makes it appear highly probable they did not believe this last, at least not in the sense of the Pythagoreans.

They held the plant misletoe in singular veneration. Pliny relates the ceremony wherewith they gathered it every year, lib. xvi. cap. 44. They placed great confidence, also, in serpents' eggs, gathered after a peculiar manner, and under a certain disposition of the moon, described by Pliny; and imagined them effectual means for the gaining of law-suits, and procuring the good graces of princes. And hence the same author concludes it is, that the caduceus, or rod encompassed with two serpents interwoven, has been assumed as a symbol of peace. Suetonius, in his Life of Claudius, assures us, they sacrificed men; and Mercury is said to be the god to whom they offered these victims. Diod. Siculus, lib. vi. observes, it was only upon extraordinary occasions they made such offerings: as, to consult what measures to take, to learn what should befal them, &c. by the fall of the victim, the tearing of his members, and the manner of his blood gushing out. Augustus condemned the custom; and Tiberius, and Claudius, punished and abolished it.

DRUM, is a martial musical instrument in form of a cylinder, hollow within, and covered at the two ends with vellum, which is stretched or slackened at pleasure by means of small cords or sliding knots. It is beat upon with sticks. Drums are sometimes made of brass, but most commonly they are of wood. The drum is by Le Clerc said to have been an oriental invention, and to have been brought by the Arabians, or perhaps rather the Moors, into Spain.

Drums (Kettle), are two sorts of large basons of copper or brass, rounded in the bottom, and covered with vellum or goat skin, which is kept fast by a circle of iron round the body of the drum, with a number of screws to draw up and down. They are much used among the horse; as also in operas, oratorios, concerts, &c.

Drum, or Drummer, he that beats the drum; of whom each company of foot has one, and sometimes two. Every regiment has a drum-major, who has the command over the other drums. They are distinguished from the soldiers by clothes of a different fashion: their post, when a battalion is drawn up, is on the flanks, and on a march it is betwixt the divisions.

Drum of the ear. See Ear, Tympanum, and Anatomy.

To Drum. *v. n.* 1. To beat a drum; to beat a tune on a drum. 2. To beat with a pulsatory motion (*Dryden*).

To **DRU'MBLE.** *v. n.* To drone; to be sluggish (*Shakspeare*).

DRUMBOTE, a town of Ireland, in the county of Monaghan. Lat. 54. 10 N. Lon. 6. 31 W.

DRU'MFISH. *s.* The name of a fish (*Woodward*).

DRUMLANRIG, a town of Dumfries-shire, in the district of Nithsdale; remarkable for a wood of oak, six miles in length. Lat. 55. 25 N. Lon. 3. 31 W.

DRUM-MA'JOR. *s.* (*drum* and *major.*) The chief drummer of a regiment (*Cleaveland*).

DRU'M-MAKER. *s.* He who deals in drums.

DRU'MMER. *s.* He whose office is to beat the drum (*Gay*).

Drummer, in entomology. See Blatta.

DRUMMOND (William), a Scotch poet. He was the son of sir John Drummond, of Hawthornden, and was born there in 1585. He was destined for the law, and had an education accordingly; but Parnassus had more charms for him than the courts, &c. and the law was totally abandoned. In his retirement at Hawthornden, he wrote several beautiful poems; but the death of a lady to whom he was about to be married affected him so much, that he went abroad, where he remained some years, and then returned to his own country. In his retirement he wrote his history of the seven kings of the name of James, and several pieces to promote peace and union in that turbulent time. He died in 1649, leaving a widow and three children. His works were printed in folio at Edinburgh in 1711.

DRU'MSTICK. *s.* The stick with which a drum is beaten.

DRUNK. *a.* (from *drink.*) 1. Intoxicated with liquor; inebriated (*Dryden*). 2. Drenched or saturated with moisture (*Deuteronomy*).

DRU'NKARD. *s.* (from *drunk.*) One given to excessive use of strong liquors; one addicted to habitual ebriety (*South*).

DRU'NKEN. *a.* (from *drunk.*) 1. Intoxicated with liquor; inebriated (*Bacon*). 2. Given to habitual ebriety. 3. Saturated with moisture (*Shakspeare*). 4. Done in a state of inebriation (*Swift*).

DRU'NKENLY. *ad.* (from *drunken.*) In a drunken manner (*Shakspeare*).

DRU'NKENNESS. *s.* (from *drunken.*) 1. Intoxication with strong liquor (*Taylor*). 2. Habitual ebriety (*Watts*). 3. Intoxication, or inebriation of any kind; disorder of the faculties (*Spenser*).

Drunkenness, a well known affection of the brain, occasioned by drinking too freely of intoxicating liquors. Drunkenness appears in different shapes in different constitutions: some it makes gay, some sullen, and some furious. The mischief of drunkenness consists in the following bad effects: 1. It betrays most constitutions either into extravagances of anger, or sins of lewdness. 2. It disqualifies men for the duties of their station, both by the temporary disorder of their faculties, and at length by a constant incapacity and stupefaction. 3. It is attended with expences, which can often be ill spared. 4. It is sure to occasion uneasiness to the family of the drunkard. 5. It shortens life. To these consequences of drunkenness must be added the peculiar danger and mischief of the example. "Drunkenness (says Paley) is a social festive vice The drinker collects his circle; the circle naturally spreads; of those who are drawn within it, many become the corrupters and centres of sets and circles of their own; every one countenancing, and perhaps emulating the rest, till a whole neighbourhood be infected from the contagion of a single example. With this observation upon the spreading quality of drunkenness may be connected a remark which belongs to the several evil effects above recited. The consequences of a vice, like the symptoms of a disease, though they be all enumerated in the description, seldom all meet in the same subject. In the instance under consideration, the age and temperature of one drunkard may have little to fear from inflammations of lust or anger; the fortune of a second may not be injured by the expence; a third may have no family to be disquieted by his irregularities; and a fourth may possess a constitution fortified against the poison of strong liquors. But if, as we always ought to do, we comprehend within the consequences of our conduct the mischief and tendency of the example, the above circumstances, however fortunate for the individual, will be found to vary the guilt of his intemperance less, probably, than he supposes, Although the waste of time and money may be of small importance to you, it may be of the utmost to some one or other whom your society corrupts. Repeated or long continued excesses, which hurt not your health, may be fatal to your companion. Although you have neither wife nor child, nor parent, to lament your absence from home, or expect your return to it with terror; other families, whose husbands and fathers have been invited to share in your ebriety, or encouraged to imitate it, may justly lay their misery or ruin at your door. This will hold good, whether the person seduced be seduced immediately by you, or the vice be propagated from you to him, through several intermediate examples."

The ancient Lacedemonians used to make their slaves frequently drunk, to give their children an aversion and horror towards it. The Indians hold drunkenness a species of madness; and in their language, the same term (*ramgam*), that signifies "drunkard," signifies also a "phrenetic."

Drunkenness, by our laws, is very properly looked upon as an aggravation rather than an excuse for any crime. For the offence of drunkenness a man may be punished in the ecclesiastical court, as well as by justices of peace by statute. And by 4 Jac. I. c. 5. and 21 Jac. I. c. 7. if any person shall be convicted of drunkenness by the view of a justice, oath of one witness, &c. he shall forfeit 5s. for the first offence, to be levied by distress and sale of his goods; and for want of a distress, shall sit in the stocks six hours: and, for the second offence, he is to be bound with two sureties in 10l. each, to be of good behaviour, or to be committed. And he who is guilty of any crime through his own voluntary drunkenness, shall be punished for it as if he had been sober. It has been held that drunkenness is a sufficient cause to remove a magistrate: and the prosecution for this offence by the statute of 4 Jac. I. c. 5, was to be, and still may be, before justices of peace in their sessions by way of indictment, &c. Equity will not relieve against a bond, &c. given by a man when drunk, unless the drunkenness is occasioned through the management or contrivance of him to whom the bond is given.

DRUPA. In botany. Pericarpium farctum evalve, nucem continens. A pulpy pericarp or fruit without valves, containing a nut or stone with a kernel. As plum, apricot, peach, almond, olive, &c. Some call this sort of fruit prunus or plum. It is usually a moist succulent fruit; but sometimes dry, as the almond.

DRUPACEÆ. The thirty-eighth order in Linnéus's Fragments of a Natural Method; containing those trees which bear a drupe or plum.

DRUSES, a people of Syria, on the mountains Libanus and Antilibanus. Their language is the Arabic; and their religion peculiar to themselves, consisting of certain mysterious ceremonies, accompanied with very little, if any, zeal. They are warlike, inured to labour, are great enemies of the Turks, and have their particular princes, called Emirs.

DRUSIUS (John), a learned protestant, born at Oudenard in Flanders, in 1555. He was educated at Ghent, and Louvain; but learnt Hebrew at Cambridge. He was for some time professor of the oriental languages at Oxford; but afterwards went to Traneker, where he became professor of Hebrew, and died in 1616. He wrote several learned works; and held a vast correspondence with the learned: for, besides letters in Hebrew, Greek, and other languages, there were found 2300 Latin letters among his papers.

DRY. *a.* (ꝺꞃıȝ, Saxon.) 1. Arid; not wet; not moist (*Bacon*). 2. Not rainy (*Addison*). 3. Not succulent; not juicy (*Shakspeare*). 4. Being without tears (*Dryden*). 5. Thirsty; athirst (*Shakspeare*). 6. Jejune; barren; plain (*B. Jon.*). 7. Hard; severe (*Hudibras*).

To DRY. *v. a.* 1. To free from moisture; to arefy; to exsiccate (*Bacon*). 2. To exhale moisture (*Dryden*). 3. To wipe away moisture (*Denham*). 4. To scorch with thirst (*Isaiah*). 5. To drain; to exhaust (*Philips*). 6. *To* DRY *up*. To deprive totally of moisture (*Woodward*).

To DRY. *v. n.* To grow dry; to lose moisture; to be drained of its moisture.

DRY ROT, a disease incident to timber used for building, such as flooring-boards, joists, wainscoting, &c. supposed to proceed from the boletus lachrymans. (See BOLETUS.) Dr. Darwin is of opinion, that the dry-rot may be entirely prevented, by soaking the timber first in lime-water, till it has absorbed as much of it as possible, and after it has become dry, immersing it in a weak solution of vitriolic acid in water, which he supposes will not only preserve it from decay for many centuries (if it be kept dry), but also render it less inflammable; a circumstance that merits considerable attention in constructing houses. In the Transactions of the Society for the Encouragement of Arts, we meet with the following account of the cause of the dry-rot in timber, and the method of preventing it, communicated by Mr. Batson, of Limehouse. He observes, that the dry-rot having taken place in one of his parlours, to such a degree as to require the pulling down part of the wainscot every third year, and perceiving that it arose from a damp, stagnated air, and from the moisture of the earth, he determined, in the month of June, 1783, to build a narrow closet next the wall through which the moisture came to the parlour. This expedient had the desired effect. But, though the rot in the parlour was totally stopped, the evil soon appeared in the closet, where fungi of a yellow colour arose in various parts. In the autumn of the year 1786 the closet was locked up about ten weeks: on opening it, numerous excrescences were observed about the lower part; a white mould was spread by a plant resembling a vine, or sea-weed; and the whole of the inside, china, &c. was covered with a fine powder of the colour of brick-dust. On cleaning out the closet, it was discovered that the disease had affected the wood so far as to extend through every shelf, and the brackets that supported them. In the beginning of the year 1780, he determined to strip the whole closet of lining and floor, not to leave a particle of the wood behind, and also to dig, and take away, about two feet of the earth in depth, and leave the walls to dry, so as to destroy the roots or seeds of the evil. When, by time, the admission of air, and good brushing, it had become properly dry and cleansed, he filled it, of sufficient height for the joists, with anchor-smith's ashes, because no vegetable will grow in them. The joists being sawed off to their proper lengths, and fully prepared, they and their plates were well charred, and laid upon the ashes; particular directions being given, that no scantling or board might be cut or planed in the place, lest any dust or shavings might drop among the ashes. The flooring-boards being very dry, he caused them to be laid close, to prevent the dust getting down, which perhaps, in the course of time, might bring on vegetation. The framing of the closet was then fixed up, having all the lower pannels let in, to be fastened with buttons only, so that, if any vegetation should arise, the pannels might with ease be taken out and examined. In some situations it might be expedient and necessary to take out a greater depth of earth; and where ashes can be had from a foundry, they may be substituted for those of anchor-smiths; but house ashes are by no means to be depended upon. At the expiration of seven years from the period of making this experiment the wainscot was removed, and the flooring-boards also taken up, when they were found entirely free from any appearance of the rot: two pieces of wood (yellow fir) which had been driven into the wall as plugs, without being previously charred, were alone affected with this disease. (*British Encyclo.*).

DRYADS, in the heathen theology, a sort of deities, or nymphs, which the ancients thought inhabited groves and woods. They differed from the Hamadryads; these latter being attached to some particular tree, with which they were born, and with which they died; whereas the Dryades were goddesses of trees and woods in general. See HAMADRYADES.

DRYA'NDRA. In botany, a genus of the class diœcia, order monadelphia. Calyx two-leaved; petals five; stamens nine; fruit three or four grained; seeds solitary. One species only; a dwarf tree of Japan; with leaves at the end of the twigs, heart-shaped, entire, glabrous; pannicle spreading, and yellow flowers.

DRYAS. Mountain avens. In botany, a genus of the class icosandria, order polygynia. Calyx eight or ten-cleft, inferior; petals five or eight; seeds with long feathery awns; receptacle depressed. One species only; found in the mountains of our own country, and in Denmark.

DRYDEN (John), a great English poet, was born of an ancient family, at Aldwinkle, in Northamptonshire, in 1631, and educated at Westminster school, from whence he removed to Trinity college, Cambridge. In 1658 he wrote an elegy on Oliver Cromwell; and in 1660, a poem on the restoration of Charles II. His productions were now rapid, and procured him the place of poet-laureat on the death of Davenant in 1668. The same year appeared his essay on dramatic poesy, which was replied to by sir Robert Howard, and vindicated by the author. In 1669 he brought out his first play, entitled, The Wild Gallant, a comedy, which met with indifferent success. He was not discouraged, however, but went on in his dramatic career, and produced a great number of plays, some of which possess considerable merit. In 1671 he was exposed to ridicule on the stage in the character of Bays, in the duke of Buckingham's comedy of The Rehearsal. In 1679 appeared an essay on satire, written by the earl of Mulgrave and Mr. Dryden. This piece contained some severe strokes on the earl of Rochester, who employed three fellows to cudgel Dryden as he came out of a coffee-house in Covent-garden. In 1681 he published his Absalom and Achitophel, which was a keen satire on the duke of Monmouth and his abettors. In 1682 he printed his poem, entitled, Religio Laici, intended for a defence of revealed religion. In 1684 he translated Maimbourg's History of the League, in which he had been employed by Charles II. on whose death he wrote his Threnodia Augustalis. On the accession of James II. he turned Roman catholic, which laid him open to the lashes of the wits; and some divines, as Stillingfleet and Burnet, handled him severely for his apostacy. Like most converts, Dryden chose to show his sincerity by writing in defence of his new religion; but unfortunately, he did it in such a manner, as only to bring both himself and his faith into ridicule. His poem, called the Hind and Panther, is a most ridiculous attempt to vindicate the church of Rome, which is represented by the first beast, and the church of England by the latter. This poem was answered by Montague and Prior, in a piece entitled, The Hind and Panther, transposed to the story of the Country Mouse and City Mouse. He was dismissed from the office of poet-laureat at the revolution, and was succeeded by Shadwell, whom he severely satirised in his Mac Flecnoe. In 1688 he published a translation of father Bouhour's Life of St. Francis Xavier; and in 1693 appeared his translation of Juvenal and Perseus. In 1693 came out his translation of du Fresnoy's Art of Painting; and two years after his translation of Virgil. In 1698 he published his Fables, ancient and modern. He died in 1701, and was buried in Westminster-abbey, where there is a monument to his memory erected by John Sheffield, duke of Buckingham. Mr. Dryden married lady Elizabeth Howard, daughter of the earl of Berkshire, by whom he had three sons, Charles, John, and Henry. Charles was made usher of the palace to pope Clement XI. but returning to England he was drowned near Windsor in 1704. John wrote a comedy, called the Husband his own Cuckold; and Henry became a monk.

Congreve, whose authority cannot be suspected, has given us such an account of Dryden, as makes him appear no less amiable in his private character as a man, than he was illustrious in his public one as a poet. In the former light, according to that gentleman, he was humane, compassionate, forgiving, and sincerely friendly: of an extensive reading, a tenacious memory, and a ready communication: gentle in the correction of the writings of others, and patient under the reprehension of his own deficiencies: easy of access himself, but slow and diffident in his advances to others; and of all men the most modest and the most easy to be discountenanced in his approaches either to his superiors or his equals. As to his writings, he is perhaps the happiest in the harmony of his numbers of any poet who ever lived either before or since his time, not even Mr. Pope himself excepted. His imagination is ever warm, his images noble, his descriptions beautiful, and his sentiments just and becoming. In his prose he is poetical without bombast, concise without pedantry, and clear without prolixity. His dramatic have, perhaps, the least merit of all his writings: indeed, his comedies are, most of them, particularly deserving of censure, on account of the loose sentiments and obscene expressions with which they abound. It is true, we have been reminded that he lived in an immoral age; and we have been desired to consider, that

"Those who live to please, must please to
live."

The apology, however, in our opinion, is not sufficiently forcible; and it comes with the least possible weight when it proceeds from those who point to the stage as the great engine of the reformation of mankind. Much interesting information respecting this great poet will be found in the elegant works of Malone and Walter Scott.

DRY'ER. *s.* (from *dry.*) That which has the quality of absorbing moisture (*Temple*).

DRY'EYED. *a.* (*dry* and *eye.*) Without tears; without weeping (*Milton*).

DRYING OIL, oil prepared by boiling with litharge, forming the basis of a vast number of paints and varnishes. See Oils fixed.

DRY'LY. *ad.* (from *dry.*) 1. Without moisture. 2. Coldly; frigidly; without affection (*Dry.*). 3. Jejunely; barrenly (*Pope*).

DRY'NESS *s.* (from *dry.*) 1. Want of moisture; siccity (*Bentley*). 2. Want of succulence (*Shakspeare*). 3. Want of embellishment; want of pathos; jejuneness; barrenness (*Ben Jonson*). 4. Want of sensibility in devotion; want of ardour; aridity (*Taylor*).

DRY'NURSE. *s.* (*dry* and *nurse.*) 1. A woman who brings up and feeds a child without the breast. 2. One who takes care of another (*Shakspeare*).

To **Dry'nurse.** *v. a.* To feed without the breast (*Hudibras*).

DRY'OPS. In zoology, a tribe of insects of the coleopterous genus cryptocephalus, thus named by Fabricius in his entomology. See Cryptocephalus.

DRYPIS. In botany, a genus of the class pentandria, order tryginia. Calyx five-toothed; petals five; capsule opening transversely all round; one-seeded. One species only: found in Italy and Barbary: a shrubby plant with procumbent, four-sided stems; leaves subulate, mucronate; those of the fork lanceolate, three-toothed on each side; corols crowned.

DRY'SHOD. *a.* Without wet feet; without treading above the shoes in the water (*Sidney*).

DU'AL. *a.* (*dualis*, Latin.) Expressing the number two (*Clarke*).

DUALISM, or Ditheism, an opinion which supposes two principles, two gods, or two independent uncreated beings, of which one is the first cause of good, the other of evil. See Manichees.

To **DUB.** *v. a.* (dubban, Saxon.) 1. To make a man a knight by a blow with the sword (*Hayward*). 2. To confer any kind of dignity (*Cleaveland*).

Dub. *s.* A blow; a knock (*Hudibras*).

DUBBING, in the cocking glossary, is taking off the comb and gills from a game chick before he is turned to a master walk. The operation is performed with a penknife for the comb, and a pair of scissors for the gills: after which it is necessary to wash the parts with vinegar or weak salt and water.

DUBHE, in astronomy, a name given to the star marked α in Ursa major. It is, likewise, often called the upper Pointer.

DUBIO'SITY. *s.* (from *dubious.*) A thing doubtful: not used (*Brown*).

DU'BIOUS. *a.* (*dubius*, Latin.) 1. Doubting; not settled in an opinion. 2. Uncertain; that of which the truth is not fully known (*Derham*). 3. Not plain; not clear (*Milton*). 4. Having the event uncertain (*Milton*).

DU'BIOUSLY. *ad.* (from *dubious.*) Uncertainly; without any determination (*Swift*).

DU'BIOUSNESS. *s.* Uncertainty; doubtfulness (*Broome*).

DU'BITABLE. *a.* (*dubito*, Latin.) Doubtful; uncertain; what may be doubted.

DUBITA'TION. *s.* (*dubitatio*, Latin.) The act of doubting; doubt (*Grew*).

DUBITATIVE CONJUNCTIONS. See Grammar.

DUBLIN, a county of Ireland, 27 miles long, and 17 broad, having the Irish Sea on the E. Kildare and East Meath on the W. and N.W. and Wicklow on the S. It sends 10 members to parliament, contains 87 parishes, 4 market towns, and 1 city.

Dublin, by the Saxons called Duffin, by the Welch Dinas-dulin, and in the Irish language Balacloigh; i. e. a town upon hurdles, on which the people think the city is founded, the ground being soft and quaggy. But the original words signify a walled town, particularly raised with stones. The Roman name is Eblana. This city is the metropolis of Ireland, the second city in the British dominions, and contains near 200,000 inhabitants. It is 270 miles distant from London, and 60 from Holyhead in Wales. It stands about 7 miles from the sea, at the bottom of a large bay, on the river Liffey. The river Liffey is crossed by six bridges; the sides are embanked with spacious quays, so that vessels can load and unload before the houses of the merchants. The bay is about seven miles broad, and unsafe in stormy weather, but the channel is confined for three miles on each side by a broad stone wall, for the protection of ships in the road. Vessels which draw more than seven feet cannot come up to the quay. A floating light has been erected on the north side of the harbour, to prevent accidents, and lighted every night; and, in the daytime, a flag is constantly hoisted from half flood to half ebb. The entrance into the harbour is thought to be one of the most beautiful in Europe. In this city are twenty parishes, and eighteen churches, some chapels of ease, the cathedral, and the collegiate, Christ's Church. . Dublin is the see of an archbishop, erected in the year 1152; it was a bishopric in the 7th century, and, in the year 1214, the bishopric of Glandalough, which was founded in the 6th century, was incorporated with Dublin. The see of Dublin has two cathedrals, both within the city, Christ-church, founded for regular canons, and converted into a collegiate church for a dean and chapter by Henry VIII. in the year 1541, and St. Patrick, for thirteen, now twenty-two prebendaries. The university was first projected in the year 1311, but did not flourish till the reign of queen Elizabeth, who granted it a charter. James I. endowed it with large estates in the province of Ulster. Charles I. was likewise a benefactor, and, in the year 1637, granted it a new charter and statutes. It consists of a chancellor, a vice-chancellor, provost, vice-provost, twenty-two fellows, and five royal professorships of divinity, common law, civil law, physic, and Greek; besides these, three others were founded by sir Patrick Dun, of physic, chirurgery, and pharmacy; there are likewise professorships of mathematics, oriental languages, oratory, history, and natural philosophy: the number of students is usually about 400, including seventy on the foundation. The building is noble and spacious, and consists of two quadrangles. An observatory has been erected on a rocky hill, about four miles north-west of the city. The castle, where the lord-lieutenant resides, is situated nearly in the centre of the town: it was not used as a palace, or residence of the viceroy, till the reign of Elizabeth, when it was repaired and beautified by sir Henry Sidney, lord deputy. The parliament house is a magnificent building, erected between the years 1729 and 1739, at the expence of 40,000*l.* The Royal Exchange cost likewise 40,000*l* and was ten years building, from the year 1769 to the year 1779. The Custom-house is a magnificent building: so are the courts of justice. Other public buildings of note' are the linen hall, the barracks, the theatre, the tollsell, or town-house, hospitals for invalids, for the children of soldiers and sailors, and for the reception of the aged and infirm; for lying-in women, for the blind, &c. The royal college of physicians was established in the year 1679; the royal college of surgeons in the year 1785; the academy for the advancement of science, polite literature, and antiquities, in 1786. Other societies are for soldiers' orphans; the marine society; society for promoting the linen and hemp manufacture; for improving agriculture, &c. The civil government of Dublin is executed by a lord mayor, recorder, two sheriffs, twenty-four aldermen, and a common council, formed of representatives from the twenty-five corporations. The mayor tries all offences, even capital ones, except murder and treason, and matters of property, for any sum under 20*l.* A new police, lately established by act of parliament, under a chief and three assistant commissioners and four divisional justices, who are aldermen of the city, consists of forty horse, and 400 foot, well-armed, trained, and clothed, stationed in watch-houses, and patrolling the streets every night. Besides the silk, woollen, and worsted manufactures carried on in that quarter of the suburbs, called *The Earl of Meath's Liberty*, and considerably improved within these few years, other branches of useful manufacture are establishing in different parts of the metropolis; and though the trade in Dublin has heretofore consisted chiefly in the importation of foreign commodities, yet now that the restriction of its woollen and most other goods are removed, it is hoped the daily enlargement of the export trade will cause a proportional increase of opulence. Dublin is remarkably well supplied with provisions; with coals, chiefly from Scotland and Cumberland, and with water from the Liffey, by machines curiously constructed at Island-bridge on the north, and from a fine reservoir on the south. The Phœnix Park, at the west end of the town, was formerly part of the lands of the monastery of St. John of Jerusalem. It is an extensive royal inclosure, seven miles in circuit, diversified with woodland, champain, and rising ground, and well stocked with deer; and, besides the Hibernian school, is adorned with the viceroy's beautiful villa, the seats of the principal secretary, and a few others. Lat. 53. 21 N. Lon. 6. 6¼ W.

DUCAL, in general, something belonging to a duke. (See DUKE.) The letters patent granted by the senate of Venice are called ducals: so also are the letters written in the name of the senate to foreign princes. The denomination of ducal is derived hence; that, at the beginning of such patents, the name of the duke or doge is written in capitals, thus, *N— Dei Gratia Dux Venetiarum*, &c. The date of ducals is usually in Latin, but the body is in Italian. A courier was dispatched with a ducal to the emperor, returning him thanks for renewing the treaty of alliance, in 1716, against the Turks, with the republic of Venice.

DUCAL MANTLE, in helminthology. See OSTREA.

DUCAT, a foreign coin, either of gold or silver, struck in the dominions of a duke; being about the same value with a Spanish piece of eight, or a French crown, or four shillings and six pence sterling, when of silver; and twice as much, when of gold. See MONEY.

The Spaniards have no ducats of gold; but, in lieu thereof, they make use of the silver one; which, with them, is no real species, but only a money of account, like our pound. It is equivalent to eleven rials.

DUCATOON, a silver coin struck chiefly in Italy, though there are also Dutch and Flemish ducatoons. They are valued at about 4*s.* 8*d.* sterling. There is also a gold ducatoon struck and current in Holland; it is valued at about 20 Florins.

DUCENARIUS, in antiquity, an officer in the Roman army who had the command of 2000 men.

DUCENTESIMA, a tax of the 200th penny, exacted by the Romans.

DUCK, in ornithology. See ANAS.

DUCK-BERNACLE, in ornithology. See LEPAS.

DUCK, is also used to denote, 1. A word of endearment, or fondness (*Shakspeare*). 2. A declination of the head (*Milton*). 3. A stone thrown obliquely on the water, called duck and drake (*Arbuthnot*).

To DUCK. *v. n.* (from the noun.) 1. To dive under water as a duck (*Spenser*). 2. To drop the head as a duck (*Swift*). 3. To bow low; to cringe (*Shakspeare*).

To DUCK. *v. a.* To put under water.

DUCK CREEK, a town of United America, in the state of Delaware, which carries on a considerable trade with Philadelphia: twelve miles NW. of Dover.

DUCK, a lake of North America. Lon. 108. 30 W. Lat. 54. 50 N.

DUCK, a river of United America, in the Tennassee government, which runs into the Tennassee, 58 miles SSW. Clarksville.

Duck Island, a small island in the Atlantic, near the coast of Main in United America. Lon. 67. 43 W. Lat. 44. 46 N.

DU'CKER. *s.* (from *duck.*) 1. A diver. 2. A cringer.

DUCKING, plunging in water, a diversion anciently practised among the Goths by way of exercise; but among the Celtæ, Franks, and ancient Germans, it was a sort of punishment for persons of scandalous lives.

Ducking is also a penalty which veteran sailors pretend to inflict on those who, for the first time, pass the tropic of Cancer, the equator, or the straits of Gibraltar, in consequence of their refusal or incapacity to pay the usual fine levied on this occasion.

Ducking-stool. See Cucking-stool.

DUCKLE'GGED. *a.* Short-legged (*Dryden*).

DU'CKLING. *s.* A young duck (*Ray*).

DU'CKMEAT. *s.* A common plant growing in standing waters; duckweed. See Lenticula

To DUCKO'Y. *v. a.* (mistaken for *decoy.*) To entice to a snare (*Grew*).

Ducko'y. *s.* Any means of enticing and ensnaring (*Decay of Piety*).

DU'CKSFOOT. *s.* Black snakeroot, or may apple (*Miller*).

DU'CKWEED. *s.* Duckmeat (*Bacon*).

DUCT. *s.* (*ductus,* Latin.) 1. Guidance; direction (*Hammond*). 2. A passage through which any thing is conducted (*Arbuthnot*).

DU'CTILE. *a* (*ductilis,* Latin.) 1. Flexible; pliable (*Dryden*). 2. Easy to be drawn out into length (*Dryden*). 3. Tractable; obsequious; complying (*Addison*).

DU'CTILENESS. *s.* (from *ductile.*) Flexibility; ductility (*Donne*).

DUCTI'LITY. *s.* (from *ductile.*) 1. Quality of suffering extension; flexibility (*Watts*). 2. Obsequiousness; compliance.

Ducti'lity. (*Geshweidikeit,* German.) The extensibility and cohesion of particles which enables a metal to be drawn out into wire without breaking. There is but a slight shade of difference between this property and that of Malleability.

The great ductility of some bodies, especially gold, is very surprising: the gold-beaters and wire-drawers furnish us with abundant proofs of this property; they every day reduce gold into lamellæ inconceivably thin, yet without the least aperture or pore discoverable, even by the microscope: a single grain of gold may be stretched under the hammer, into a leaf that will cover a house, and yet the leaf remain so compact as not to transmit the rays of light, nor even admit spirit of wine to transude. Dr. Halley took the following method to compute the ductility of gold: he learned from the wire-drawers, that an ounce of gold is sufficient to gild, that is, to cover or coat, a silver cylinder of forty-eight ounces weight, which cylinder may be drawn out into a wire so very fine, that two yards shall weigh only one grain; and consequently ninety-eight yards of the same wire, only forty-nine grains: so that a single grain of gold here gilds ninety-eight yards; and, of course, the ten-thousandth part of a grain is here above one-third of an inch long. And since the third part of an inch is yet capable of being divided into ten less parts visible to the naked eye, it is evident that the hundred-thousandth part of a grain of gold may be seen without the assistance of a microscope. Proceeding in his calculation, he found, at length, that a cube of gold, whose side is the hundredth part of an inch, contains 2,433,000,000 visible parts; and yet, though the gold with which such wire is coated is stretched to such a degree, so intimately do its parts cohere, that there is not any appearance of the colour of the silver underneath.

Mr. Boyle, examining some leaf-gold, found that a grain and a quarter in weight took up an area of fifty square inches; supposing therefore the leaf divided by parallel lines 100th part of an inch apart, a grain of gold will be divided into five hundred thousand minute squares, all discernible by a good eye: the same author shews, that an ounce of gold drawn out in wire would reach 155 miles and a half.

But Mr. Reaumur has carried the ductility of gold to a still greater extent. What is called gold-wire, every body knows, is only a silver one gilt. The cylinder of silver, covered with leaf-gold, they draw through the hole of an iron, and the gilding still keeps pace with the wire, stretch it to what length they can. Now Mr. Reaumur shows, that in the common way of drawing gold-wire, a cylinder of silver twenty-two inches long, and fifteen lines in diameter, is stretched to 1,163,520 feet, or is 634,692 lines longer than before, which amounts to about ninety-seven leagues. To wind this thread on silk for use, they first flatten it, in doing which it stretches at least one-seventh farther, so that the twenty-two inches are now 111 leagues; but in the flattening, instead of one-seventh, they could stretch it one-fourth, which would bring it to 120 leagues. This appears a prodigious extension, and yet it is nothing to what this gentleman has proved gold to be capable of.

Ductility of glass. We all know that, when well penetrated with the heat of the fire, the workmen can figure and manage glass like soft wax; but what is most remarkable, it may be drawn, or spun out, into threads exceedingly long and fine.

Our ordinary spinners do not form their threads of silk, flax, or the like, with half the ease and expedition the glass-spinners do threads of this brittle matter. We have some of them used in plumes for children's heads, and divers other works, much finer than any hair, and which bend and wave like hair with every wind.

Nothing is more simple and easy than the method of making them. There are two workmen employed; the first holds one end of a piece of glass over the flame of a lamp; and, when the heat has softened it, a second operator applies a glass hook to the metal thus in fusion; and, withdrawing the hook again, it brings with it a thread of glass, which still adheres to the mass: then, fitting his hook on the circumference of a wheel about two feet and a half in diameter, he turns the wheel as fast as he pleases; which, drawing out the thread, winds it on its rim, till, after a certain number of revolutions, it is covered with a skain of glass-thread.

The mass in fusion over the lamp diminishes insensibly: being wound out like a clue of silk upon the wheel; and the parts, as they recede from the flame, cooling, become more coherent to those next to them, and this by degrees: the parts nearest the fire are always the least coherent, and, of consequence, must give way to the effort the rest make to draw them towards the wheel.

The circumference of these threads is usually a flat oval, being three or four times as broad as thick; some of them seem scarcely bigger than the thread of a silk-worm, and are surpisingly flexible. If the two ends of such threads are knotted together, they may be drawn and bent, till the aperture, or space in the middle of the knot, does not exceed one-fourth of a line, or one-forty-eighth of an inch, in diameter.

Hence M. Reaumur advances, that the flexibility of glass increases in proportion to the fineness of the threads; and that, probably, had we but the art of drawing threads as fine as a spider's web, we might weave stuffs and cloths of them for wear. Accordingly, he made some experiments this way; and found that he could make threads fine enough, viz. as fine, in his judgment, as spider's thread, but he could never make them long enough to do any thing with them.

DUCTS BILIARY. See BILIARY DUCTS.

DUCTS COMMUNIS CHOLEDOCHUS. See CHOLEDOCHUS DUCTUS.

DUCTUS AD NASUM. See CANALIS NASALIS.

DUCTUS HEPATICUS. See HEPATIC DUCT.

DUCTUS LACHRYMALIS. See LACHRYMAL DUCTS.

DUCTUS LACTIFERI. Ductus galactoferi. The excretory ducts of the glandular substance composing the female breast. The milk passes along these ducts to the nipple.

DUCTUS PANCREATICUS. The pancreatic duct. It is white and small, and arises from the sharp extremity of the pancreas, runs through the middle of the gland towards the duodenum, into which it pours its contents by an opening common to it and the ductus communis choledochus.

DUCTUS SALIVALES. The excretory ducts of the salivary glands, which convey the saliva into the mouth.

DUCTUS STENONIS. The Stenonian duct, which was so called after its discoverer Steno, arises from all the small excretory ducts of the parotid gland. It passes transversely over the masseter muscle, penetrates the buccinator, and opens into the mouth.

DUCTUS WARTHONIANUS. The excretory duct of the maxillary glands; so named after its discoverer.

DU'DGEON. s. (*dolch*, German.) 1. A small dagger (*Shakspeare*). 2. Malice; sullenness; malignity (*Hudibras*).

DUDLEY, a town in Worcestershire, with a market on Saturdays, and a great manufacture of nails and other iron wares. This town contains 2,040 houses, and 10,107 inhabitants. Lat. 52. 33 N. Lon. 2. 0 W.

DUDLEY (Sir Robert), as he was called in England, and, as he was styled abroad, earl of Warwick and duke of Northumberland, was the son of Robert earl of Leicester, by the lady Douglas Sheffield; and was born at Sheen in Surrey, in 1573, where he was carefully concealed, to prevent the queen's knowledge of the earl's engagements with his mother. He studied at Oxford; when his father dying, left him the bulk of his estate. He was at this time one of the finest gentlemen in England; and having a particular turn to navigation, fitted out a small squadron at his own expence, with which he sailed to the river Oroonoque, and took and destroyed nine sail of Spanish ships In 1595 he attended the earl of Essex, and the lord high admiral of England, in their expedition against the Spaniards; when, for his gallant behaviour at the taking of Cadiz, he received the honour of knighthood. He now endeavoured to prove the legitimacy of his birth, in order to be intitled to his hereditary honours. But being overpowered by the interest of the countess dowager of Leicester, he applied for a license to travel; and being well received at the court of Florence, resolved to continue there, notwithstanding his receiving a letter of recall; on which his whole estate was seized by king James I. and vested in the crown. He discovered at the court of Cosmo II. great duke of Tuscany, those great abilities for which he had been admired in England, and was at length made chamberlain to his serene highness's consort. He there contrived several methods of improving shipping; introduced new manufactures; and by other services obtained so high a reputation, that at the desire of the archduchess, the emperor Ferdinand, in 1620, created him a duke of the holy Roman empire. He afterwards drained a vast tract of morass between Pisa and the sea; and raised Leghorn, which was then a mean, pitiful place, into a large and beautiful town, improving the haven by a mole, which rendered it both safe and commodious; and having engaged his highness to declare it a free port, he, by his influence and correspondence, drew many English merchants to settle and set up houses there, which was of very great service to his native country, as well as to the Spaniards. He was also the patron of learned men, and held a high place himself in the republic of letters. His most celebrated work is his Del Arcano del Mare, in two volumes, folio.

DUE. *a.* participle passive of *owe*. (*dû*, Fr) 1. Owed; that any one has a right to demand (*Smalridge*). 2. Proper; fit; appropriate

(*Atterbury*). 3. Exact; without deviation (*Milton*) 4. Consequent to; occasioned by (*Boyle*).

Due. *ad.* (from the adjective.) Exactly; directly; duly (*Shakspeare*).

Due. *s.* (from the adjective.) 1. That which belongs to one; that which may be justly claimed (*Swift*). 2. Right; just title (*Milton*). 3. Whatever custom or law requires to be done (*Dryden*). 4. Custom; tribute (*Addison*).

To Due. *v. a.* To pay as due (*Shakspeare*).

DUEL, a single combat, at a time and place appointed, in consequence of a challenge. This custom came originally from the northern nations, among whom it was usual to decide all their controversies by arms. Both the accuser and accused gave pledges to the judges on their respective behalf; and the custom prevailed so far amongst the Germans, Danes, and Franks, that none were excused from it but women, sick people, cripples, and such as were under 21 years of age or above 60. Even ecclesiastics, priests, and monks, were obliged to find champions to fight in their stead. The punishment of the vanquished was either death, by hanging or beheading; or, mutilation of members, according to the circumstances of the case. Duels were at first admitted not only on criminal occasions, but on some civil ones for the maintenance of rights to estates, and the like: in latter times, however, before they were entirely abolished, they were restrained to these four cases. 1. That the crime should be capital. 2. That it should be certain the crime was perpetrated. 3. That the accused be reckoned guilty by common fame. 4. That the matter be not capable of proof by witnesses.

Duel, at present, is used for single combat on some private quarrel; and it must be premeditated, otherwise it is called a rencounter.

Deliberate duelling is by the law of England a species of murder; and accordingly, it charges both the crime and punishment of murder on the principals; and, as some say, on their seconds also. (Blackst. Com. vol. iv.) And yet, so powerful is the dominion of fashion, that neither the terror of penal laws, nor reverence for religion, have been able entirely to abolish a practice unknown among the ancients, irreconcileable to any principle of reason, and totally inconsistent with the dictates of revelation.

Public opinion is not easily controlled by civil institutions; for which reason it may be questioned whether any regulations can be contrived of sufficient force to suppress or change the rule of honour which stigmatizes all scruples about duelling with the reproach of cowardice. The inadequate redress which the law of the land affords for those injuries which chiefly affect a man in his sensibility and reputation, tempts many to redress themselves: and prosecutions for such offences, by the trifling damages that are recovered, serve only to make the sufferer ridiculous. For this, however, more ought to be found. Perhaps for the army, where the point of honour is cultivated with exquisite attention and refinement, there might be established a Court of Honour, with a power of awarding those submissions and acknowledgments which it is generally the object of a challenge to obtain; and it might grow into a fashion with persons of rank of all professions to refer their quarrels to the same tribunal.

In fact, as the law now stands, duelling can seldom be overtaken by legal punishment. The challenge, appointment, and other previous circumstances, which indicate the intention with which the combatants met, being suppressed, nothing appears to a court of justice but the actual rencounter; and thus, we find, that the perpetrators of these scandalous, though fashionable crimes, elude the hands of justice, and the folly, or rather, madness, of duelling, is enlarging its dominion, whilst every friend to humanity, to religion, and to happiness, wishes to see the disgraceful practice banished from the civilised world.

Among the few published productions of the late learned and universally beloved Thomas Jones, A.M. of Trinity college, Cambridge, was a very admirable sermon against duelling. Will the reader excuse the writer of this article, if he take this opportunity to say of Mr. Jones, that he cannot recollect any other man to whom the language in which Seneca spoke of his brother Gallio might be so justly applied?—"*Nemo omnium mortalium uni tam dulcis est, quam hic, omnibus.*"

To Duel. *v. n.* (from the noun.) To fight a single combat (*Locke*).

To Duel. *v. a.* To attack or fight with singly (*Milton*).

DU'ELLER. *s.* (from *duel.*) A single combatant (*Decay of Piety*).

DU'ELLIST. *s.* (from *duel.*) 1. A single combatant (*Suckling*). 2. One who professes to study the rules of honour (*L'Estrange*).

DUE'LLO. *s.* (Italian.) The duel; the rule of duelling (*Shakspeare*).

DUE'NNA. *s.* (Span.) An old woman kept to guard a younger (*Arbuthnot and Pope*).

DUETT, Duetto, in music, a composition expressly written for two voices or instruments, with or without a bass and accompaniments. In good duets the execution is pretty equally distributed between the two parts, and the melodies so connected, intermingled, and dependant on each other, as to lose every effect when separated, but to be perfectly related and concinnous when heard together.

DUG. *s.* (*deggio*, to give suck, Islandick.) A pap; a nipple, a teat (*Creech*).

Dug. The preterit and part. pass. of *dig*.

DUGDALE (Sir William), an eminent English historian, antiquarian, and herald, born in Warwickshire in 1605. He was introduced into the herald's office by sir Christopher Hatton; and ascended gradually through all the degrees, until he became garter principal king at arms. His chief work is the Monasticon Anglicanum, in three vols. folio; containing the charters and descriptions of all the English monasteries, adorned with engravings; in the former part of which work he was assisted by Mr. Roger Dodsworth. Nor are his Antiquities of Warwickshire less esteemed. He wrote likewise, among other things of less note, the History of St. Paul's Cathedral; a History of Embanking and Draining; a Baronage of England; and completed the second volume of sir Henry Spelman's Councils, with a second part of his Glossary. He died in 1686. His son, sir John, was Norroy king at at arms, and published a Catalogue of English Nobility.

DUKE, Dux, a sovereign prince, without the title or quality of king. Such are the duke of Lorrain, of Holstein, of Savoy, of Parma, &c. The word is borrowed from the modern Greeks, who called *doucas* what the Latins call *dux*. There are also two sovereigns who bear the title of grand-duke; as the grand-duke of Tuscany, and the grand-duke of Muscovy, now called the czar or emperor of Russia. The title of great-duke belongs to the apparent heir of Russia; and the title of arch-duke is given to all the sons of the house of Austria, as also that of arch-duchess to all the daughters.

Duke, Dux, is also a title of honour or nobility, the next below princes. The dukedom, or dignity of a duke, is a Roman dignity, denominated *a ducendo*, leading or commanding. Accordingly the first dukes, *duces*, were the *ductores exercituum*, commanders of armies. Under the late emperors, the governors of provinces in war-time were intitled *duces* In after times the same denomination was also given to the governors of provinces in time of peace.

In England, during the Saxons time, Camden observes, the officers and commanders of armies were called dukes, *duces*, after the ancient Roman manner, without any addition. After the Conqueror came in, the title lay dormant, till the reign of Edward III. who created his son Edward, first called the Black Prince, duke of Cornwall, which hath ever since been the peculiar inheritance of the king's eldest son, during the life of his father, so that he is *dux natus, non creatus*. After whom, there were more made, in such manner as that their titles descended to their posterity. They were created with much solemnity, *per cincturam gladii, cappæque, et circuli aurei in capite impositionem*. However, in the reign of queen Elizabeth, A.D. 1572, the whole order became utterly extinct; but it was revived about fifty years afterwards, by her successor, in the person of George Villiers, duke of Buckingham.

The dukes of our days retain nothing of their ancient splendour, but the coronet on their escutcheon, which is the only mark of their departed sovereignty. They are created by patent, cincture of the sword, mantle of state, imposition of a cape, and coronet of gold on the head, and a verge of gold in their hand. The eldest sons of dukes are by the courtesy of England styled marquisses, though they are usually distinguished by their father's second title, whether it be that of marquis or earl, and the younger sons lords, with the addition of their christian name, as lord James, lord Thomas, &c. and they take place of viscounts, though not so privileged by the laws of the land. A duke has the title of grace; and being written to, he is styled, in the herald's language, most high, potent, and noble prince. Dukes of the blood-royal are styled most high, most mighty, and illustrious princes.

Duke, among Hebrew grammarians, is an appellation given to a species of accents answering to our comma. See Accent.

Duke-duke, a quality given in Spain to a grandee of the house of Sylva, on account of his having several duchies from the uniting of two considerable houses in his person.

DU'KEDOM. *s.* (from *duke.*) 1. The seigniory or possessions of a duke (*Shaksp.*). 2. The title or quality of a duke.

DU'LBRAINED. *a.* (*dull* and *brain.*) Stupid; doltish; foolish (*Shakspeare*).

DULCA'MARA. (from *dulcis*, sweet, and *amara*, bitter.) The herb woody-nightshade: so called because its taste unites both these qualities. See Solanum.

DU'LCET. *a.* (*dulcis*, Latin.) 1. Sweet to the taste; luscious (*Milton*). 2. Sweet to the ear; harmonious (*Shakspeare*).

DULCIFICA'TION. *s.* (from *dulcify.*) The act of sweetening; the act of freeing from acidity, saltness, or acrimony (*Boyle*).

Dulcification. (*versussung*, Germ.) A term in chemistry, employed to express the rendering mild or diminishing the corrosive qualities of acids or alkalies by uniting them with some other substance, but not so as to neutralize them. Thus alkalies may be said to be dulcified when converted into soap; and the strong acids are often affirmed to be dulcified when chemically combined with spirits of wine: whence we have dulcified spirits of vitriol, dulcified spirits of nitre, &c.

To DU'LCIFY. *v. a.* (*dulcifier*, Fr.) To sweeten; to set free from acidity (*Wiseman*).

DULCIMER, a triangular musical instrument, strung with about fifty wires cast over a bridge at each end; the shortest, or most acute of which is eighteen inches long, and the longest, or most grave, thirty-six. It is performed upon by striking the wires with little iron rods. This name is also given by the translators of holy writ to an instrument used by the Hebrews, concerning the form, size, and tone of which there have been various conjectures, but of which nothing certain is known. (*Busby*).

DULCINO, in music, a wind instrument, a kind of small bassoon.

To DU'LCORATE. *v. a.* (from *dulcis*, Latin.) 1. To sweeten (*Bacon*). 2. To make less acrimonious (*Wiseman*).

DULCORA'TION. *s.* (from *dulcorate.*) The act of sweetening (*Bacon*).

DU'LHEAD. *s.* (*dull* and *head.*) A blockhead; a wretch foolish and stupid (*Ascham*).

DU'LIA. *s.* (δυλεια.) An inferior kind of adoration (*Stillingfleet*).

DULL. *a.* (*dwl*, Welsh; ꝺole, Saxon.) 1.

Stupid; doltish; blockish; unapprehensive; indocile (*Bacon*). 2. Blunt; obtuse (*Herbert*). 3. Unready; awkward (*Sidney*). 4. Hebetated; not quick (*Matthews*). 5. Sad; melancholy. 6. Sluggish; heavy; slow of motion (*Spenser*). 7. Gross; cloggy; vile (*Shak.*). 8. Not exhilarating; not delightful. 9. Not bright (*Shakspeare*). 10. Drowsy; sleepy.

To DULL. *v. a.* (from the adjective.) 1. To stupify; to infatuate (*Ascham*). 2. To blunt; to obtund (*Bacon*). 3. To sadden; to make melancholy. 4. To hebetate; to weaken (*Spenser*). 5. To damp; to clog (*Hooker*). 6. To make heavy, or slow of motion (*Bacon*). 7. To sully brightness (*Bacon*).

DU'LLARD. *s.* (from *dull.*) A blockhead; a dolt; a stupid fellow; a dunce (*Shakspeare*).

DU'LLY. *ad.* (from *dull.*) 1. Stupidly; doltishly (*Dryden*). 2. Slowly; sluggishly (*Bacon*). 3. Not vigorously; not gayly; not brightly; not keenly (*Hudibras*).

DU'LNESS.* *s.* (from *dull.*) 1. Stupidity; weakness of intellect; indocility; slowness of apprehension (*South*). 2. Want of quick perception (*Bacon*). 3 Drowsiness; inclination to sleep (*Shakspeare*). 4. Sluggishness of motion. 5. Dimness; want of lustre. 6. Bluntness; want of edge.

DULVERTON, a town in Somersetshire, with a market on Saturdays. Lat. 51. 3 N. Lon. 3. 30 W.

DULWICH, a village in Surrey, five miles south of London. It is famous for a college founded by Edward Alleyn. See ALLEYN.

DU'LY. *ad.* (from *due.*) 1. Properly; fitly (*Rogers*). 2. Regularly; exactly (*Pope*).

DUMB. *a.* (ꝺum, ꝺumbe, Saxon.) 1. Mute; incapable of speech (*Hooker*). 2. Deprived of speech (*Dryden*). 3. Mute; not using words (*Roscommon*). 4. Silent; refusing to speak (*Dryden*). See DEAF.

DUMBARTON, the chief town of the county of the same name, is seated at the confluence of the Leven and the Clyde, with a stone bridge over the former. Its principal manufacture is glass. It has 2541 inhabitants. Lat. 56. 0 N. Lon. 4. 30 W.

DUMBARTONSHIRE, anciently called Lennox, a county of Scotland, bounded by the counties of Perth, Stirling, Lanerk, Renfrew, and Argyle. It is about 50 miles long, and 12 broad; and contains 20,710 inhabitants.

DUMBLAIN, a town of Monteith, remarkable for a battle, commonly called the battle of Sheriff-moor, between the duke of Argyle and the rebels, commanded by the earl of Mar, in 1715, in which the latter was defeated. Lat. 56. 11 N. Lon. 4. 2 W.

To DU'MBFOUND. *v. a.* (from *dumb.*) To confuse; to strike dumb (*Spectator*).

DU'MBLY. *ad.* Mutely; silently.

DU'MBNESS. *s.* (from *dumb.*) 1. Incapacity to speak. 2. Omission of speech; muteness (*Shakspeare*). 3. Refusal to speak; silence (*Dryden*).

DUMFERMLING, a town of Scotland, in the county of Fife, with some considerable manufacturies of linen. It is remarkable for a royal palace, in which Charles I., king of England, was born: and it contains 9980 inhabitants. It is 13 miles N. W. of Edinburgh. Lat. 56. 5 N. Lon. 3. 27 W.

DUMFRIES, a shire of Scotland, which contains Annandale and Nithisdale. It sends one member to parliament; and contains 54,597 people.

DUMFRIES, the capital of the above county, is a place of pretty good trade. Lat. 55. 12 N. Lon. 3. 29 W. It has 7288 inhabitants.

DUMOSÆ. (*dumus*, a bush.) The nineteenth order in Linnéus Fragments, in Philos. Bot. and the forty-third of the Natural Orders in Gen. Plant.

DUMP. *s.* (from *dom*, stupid, Dutch.) 1. Sorrow; melancholy; sadness (*Hudibras*). 2. Absence of mind; reverie (*Locke*).

DU'MPISH. *ad.* (from *dump.*) Sad; melancholy; sorrowful (*Herbert*).

DU'MPLING. *s.* (from *dump*, heaviness.) A sort of pudding (*Dryden*).

DUN, or BURGH, the name of an ancient species of buildings, of a circular form, common in the Orkney and Shetland islands, the Hebrides, and northern parts of Scotland. The latter term points out the founders, who at the same time bestowed on them their natal name of *borg*, a defence or castle, a Sueo-Gothic word; and the Highlanders universally apply to these places the Celtic name *dun*, signifying a hill defended by a tower, which plainly points out their use. They are confined to the countries once subject to the crown of Norway. With few exceptions, they are built within sight of the sea, and one or more within sight of the other; so that on a signal by fire, by flag, or by trumpet, they could give notice of approaching danger, and yield a mutual succour.

DUN, in the manage, a colour partaking of brown and black.

To DUN. *v. a.* (ꝺunan, Saxon, to clamour.) To claim a debt with vehemence and importunity (*Swift*).

DUN. *s.* (from the verb.) A clamorous, importunate, troublesome creditor (*Philips*).

DUNBAR, a parliament town of Scotland. To the S.W. of this town is Dunhill moor, famous for a battle fought in 1650, between Oliver Cromwell, and general Lesly, commander of the Scottish army, when the former, with about 8000 men, routed and defeated a very numerous army, killing near 6000, and taking about 10,000 prisoners. It is 25 miles E. of Edinburgh. Lat. 56. 0 N. Lon. 2. 34 W. Here are 3970 inhabitants.

DUNCAN (Daniel), a French physician, born at Montauban, in Languedoc, in 1649. His family was originally from Scotland. He received his medical education at Montpellier, where he took his doctor's degrees. He resided at Paris till the death of Colbert, who was his patron, and then went to reside on his paternal estate at Montauban; but when the persecution raged violently against the protestants in 1690, he disposed of his house and estate, and went to Geneva. He was afterwards called to the court of the landgrave of Hesse Cassel, where he remained three years, and while there wrote a treatise on the abuse of hot liquors, which was printed at Rotterdam in 1705. The king of Prussia, hearing of his merit, invited him to Berlin, where he was appointed first physician to the royal household. However he did not long remain there, but went to the Hague, from whence, in 1714, he removed to London, where he died in 1735.

DUNCAN (William), a learned writer, born at Aberdeen in 1717. He received his education in his native city, and afterwards became professor of philosophy in the Marischal college there. He died in 1760. Mr. Duncan wrote an excellent treatise on logic, and translated several of the orations of Cicero, and Cæsar's Commentaries. He published likewise an edition of Andrew Baxter's book on the Human Soul.

DUNCANNON, a fortress and town of Ireland, in the county of Wexford. Lat. 52. 16 N. Lon. 6. 46 W.

DUNCOMBE (William), younger son of John Duncombe, esq. of Stocks in Hertfordshire, in 1722 published a translation of Racine's Athalia; which was well received by the public, and has gone through three editions. In 1724 he was editor of the works of Mr. Needler; in 1735, of the poems of his deceased brother-in-law, Mr. Hughes, 2 vols. 12mo; in 1737, of the miscellanies of his younger brother, Mr. Jabez Hughes, for the benefit of his widow, in one volume 8vo; and in 1745, of the works of the rev. Mr. Samuel Say, in one volume 4to. In 1726 he married the only sister of John Hughes, esq. whom he long survived. In 1734 his tragedy of Lucius Junius Brutus was acted at Drury-lane theatre. It was published in 1735, and again in 1747. The works of Horace, in English verse, by several hands, were published by him in two vols. 8vo., with notes, &c. in 1757. A second edition. in four vols. 12mo., with many imitations, was published in 1762. In 1763 he collected and republished seven Sermons by archbishop Herring, with a biographical preface. He died in 1769, aged 80.

DUNCE. *s.* A dullard; a dolt; a thickskull; a stupid, indocile animal (*Stillingfleet*).

DUNDALK, a seaport of Ireland, in the county of Louth, on a bay of the same name. This is a thriving town, and has a cambric manufacture, the only one in Ireland. Lat. 54. 12 N. Lon. 6. 17 W.

DUNDEE, a royal borough of Angusshire, with an excellent harbour. The inhabitants are computed at 26,080. Here are manufactures of glass, coarse linen, sail-cloth, cordage, thread, buckram, tanned leather, shoes, and hats; also a sugar house. The town is seated on the N. side of the Frith of Tay. Lat. 56. 30 N. Lon. 2. 55 W.

DUNDIVER, in ornithology. See MERGANSER.

DUNG, the excrement of quadrupeds, especially of the horse, which, in the manage, should be occasionally attended to, as such attention may sometimes tend to the prevention of disease. If the dung be bright in colour, uniform in shape and consistence, and not fœtid in smell, the body may be considered in a good state: on the contrary, if the dung, when voided, be hard, black, and offensive, or the parts adhere to each other by a viscid, ropy slime, they indicate internal and morbid heat. Horses in this state should be put under a course of physic without delay; for till they are thoroughly cleansed, they cannot with propriety be brought into any strong exertions whatever. Another advantage occasionally derived from an accurate inspection of the dung, is that we frequently trace out worms in cases in which, from the general appearance of the horse, no such disease could be suspected.

DUNG, in husbandry, is of several sorts, as that of horses, cows, sheep, hogs, pigeons, geese, hens, &c. See HUSBANDRY.

To DUNG. *v. a.* To manure with dung (*Dryden*).

DUNGANNON, the chief town of the county of Tyrone, in the province of Ulster, Ireland. Lat. 54. 38 N. Lon. 6. 39 W.

DUNGARVON, a seaport of Ireland, in the county of Waterford. Lat. 52. 6 N. Lon. 7. 29 W.

DUNGEON, DONJON, in fortification, the highest part of a castle built after the ancient mode; serving as a watch-tower, or place of observation: and also for the retreat of a garrison, in case of necessity, so that they may capitulate with greater advantage.

The word comes from the French, *donjon*, which signifies the same; and which Fauchet derives from *domicilium*, because the dungeon, being the strongest part of the castle, was usually the lord's apartment. Menage derives it from *dominione*, or *dominionus*, which in some ancient writings we find used in the same sense. Du-Cange derives the appellation from *duno aut colle ædificatum*, which the barbarous writers have altered into *dunjo*, *dungeo*, *dongio*, *dangio*, *domgio*, and *domnio*.

DU'NGFORK. *s.* (*dung* and *fork.*) A fork to toss out dung from stables (*Mortimer*).

DU'NGHIL. *s.* (*dung* and *hill.*) 1. A heap or accumulation of dung (*South*). 2. Any mean or vile abode (*Dryden*). 3. Any situation of meanness (*Sandys*). 4. A term of reproach for a man meanly born (*Shakspeare*).

DU'NGHIL. *a.* Sprung from the dunghil; mean: low; base; vile (*Spenser*).

DU'NGY. *a.* Full of dung; mean; vile; base; low; odious; worthless (*Shakspeare*).

DU'NGYARD. *s.* (*dung* and *yard.*) The place of the dunghil (*Mortimer*).

DUNKELD, a town of Perthshire, situated amid vast rocks, partly naked, and partly wooded, under which the Tay rolls its majestic stream. It is the market-town of the neighbouring Highlands, and has a linen manufacture. Lat. 56. 35 N. Lon. 3. 36 W

DUNKERS, in ecclesiastical history, a religious sect at Ephrata or Dunker-town, near Lancaster, in Pensylvania, which took their rise about fifty years ago, and consisting mostly of Germans. Their name is said to be derived from their mode of baptizing new converts, which is by dipping, after the manner of the baptists. Their habit is a kind of long coat or tunic, made of linen for the summer, and woollen for the winter, reaching down to the heels, with a sash or girdle round the waist; and a cap, or hood, hanging from the shoulders, resembling the dress of the Dominican friars. The men shave neither the head nor beard. The men and women have distinct habitations and governments: they have for this purpose erected two wooden buildings; in each of which there is a banqueting-room, and an apartment for public worship; so that they never meet together even at their devotions. They live chiefly on roots and vegetables, and eat no flesh, except on occasion of their love-feasts, when the brethren and sisters dine together. The Dunkers allow of no intercourse between the brethren and sisters, not even by marriage;—a regulation not very favourable to their subsistence and increase; and if any break through this restraint, and marry, they are removed from communion with the unmarried, to a place about a mile distant, called Mount Sion. Their principal tenet is said to be, that future happiness is only to be obtained by penance and mortification in this life; and that, as Jesus Christ, by his meritorious sufferings, became the redeemer of mankind in general, so each individual of the human race, by a life of abstinence and restraint, may work out his own salvation.

There is an interesting account of the Dunkers, and of the establishment at Ephrata, in Cispapina's Letters from America, published in 1791. We have only room for one extract: "I shall at present remark but one thing more, with respect to the Dunkers, and that is the peculiarity of their music. Upon a hint given by my friend, the sisters invited us into their chapel, and, seating themselves in order, began to sing one of their devout hymns. The music had little or no air or melody; but consisted of simple, long notes, combined in the richest harmony. The counter, treble, tenor, and bass, were all sung by women, with sweet shrill, and small voices; but with a truth and exactness in the time and intonation that was admirable. It is impossible to describe to your lordship my feelings upon this occasion. The performers sat with their heads reclined, their countenances solemn and dejected, their faces pale and emaciated from their manner of living, their clothing exceedingly white and quite picturesque, and their music such as thrilled to the very soul. I almost began to think myself in the world of spirits, and that the objects before me were ethereal. In short, the impression this scene made upon my mind continued strong for many days, and I believe will never be wholly obliterated."

DUNKIRK, a considerable seaport of France, in the department of the North, and late French Flanders. It is the most important town and harbour on the whole coast, and has commonly had a great deal of commerce. By means of a sluice 42 feet wide, a bason within the town will hold 40 ships of the line always floating. Dunkirk is divided into the Old and New Town. The number of inhabitants is estimated at 80,000. Lat. 51. 2 N. Lon. 2. 28 E.

DUNLIN, in ornithology. See TRINGA.

DUNMOW (Great), a town of Essex, with a market on Saturdays, and a manufactory of bays. Lat. 51. 54 N. Lon. 0. 24 E.

DUNMOW (Little), a village in Essex, adjoining to Great Dunmow. It had once a priory; and is still famous for the custom instituted in the reign of Henry III. by Robert de Fitzwalter, and now the tenure of the manor; namely, that whatever married couple will go to the priory, and swear, kneeling upon two sharp-pointed stones in the church, that they had not quarrelled, nor repented of their marriage, within a year and a day after it took place, shall receive from the lord of the manor a flitch of bacon. Some old records mention several that have claimed and received it. It has been actually received so lately as since the year 1750, by a weaver and his wife of Coggleshal, in Essex. It has been demanded more recently still; but the ceremony being attended with a very great expence to the lord of the manor, the demand is now evaded. See BACON.

DUNN (Samuel), an English mathematician, born at Crediton, in Devonshire, where he kept a school for some years. He afterwards removed to Chelsea, where he opened a mathematical academy, and was appointed by the East-India company mathematical examiner of the officers who were candidates for their service. He wrote several mathematical treatises, and papers in the Philosophical Transactions, and died in 1792. He founded a mathematical school at his native town. His Treatise on the Planispheres is a well-known and useful publication.

DU'NNER. *s.* (from *dun.*) One employed in soliciting petty debts (*Spectator*).

DUNS (John), commonly called Duns Scotus, a famous divine of the order of St. Francis, was born at Dunstance, in Northumberland. He was educated at Oxford, from whence he went to Paris, where he acquired a great reputation as a disputant; and, according to the custom of the age, was called the *subtil doctor*. He opposed the notions of Aquinas, which produced two parties, the Thomists and the Scotists. He died at Cologne in 1308. His works were printed at Lyons in 10 vols. folio, 1639. Paul Jovius, and others, relate that Duns fell down in a fit of apoplexy, and, being supposed dead, was buried too hastily; for that he revived in his grave, and languished in a miserable manner, beating his head and arms against the sides of the coffin till he died.

DUNSTABLE (the *Magiovinium* of the Itinerary), a town of Bedfordshire, with a market on Wednesdays. The church is the remainder of a priory, and opposite to it is a farm-house, once a royal palace. Lat. 51. 59 N. Lon. 0. 29 W.

DUNSTAN (St.) archbishop of Canterbury, was born in 924, under the reign of Athelstan, who was his relation. He retired from court in disgust, and became a monk. Edmund, successor of Athelstan, drew him from his retreat, and was guided by his advice. He was made bishop of Worcester, and afterwards archbishop of Canterbury. The pope sent him the pallium, and made him legate for the holy see in England. Edwin having succeeded Edmund, Dunstan took the liberty of reproving him for his scandalous life, on which the king banished him. His exile, however, was not of long duration, and he died in the quiet possession of his archbishopric in 988. Dunstan founded the famous monastery of Glastonbury. As this prelate was the great restorer and promoter of the monastic institutions, the grateful monks, who were almost the only historians of those dark ages, have loaded him with the most extravagant praises, and represented him as the greatest wonder-worker and highest favourite of heaven that ever lived.

DUNSTER, a town in Somersetshire, with a market on Fridays, and a harbour on the Bristol channel. Lat. 51. 13 N. Lon. 3. 41 W.

DUNUM, a Celtic term, denoting a hill or eminence.

DUNWICH, a town of Suffolk, having a market on Saturdays. By far the greater part of this town has been swallowed up by the sea. It is a corporation, sends two members to parliament, and is 99 miles N. of London. Lat. 52. 21 N. Lon. 1. 55 E.

DUO, in music, a duett.

DUODECIMALS, in arithmetic, numbers proceeding in a proportion of twelves. Or, duodecimals are numbers in that scale of notation in which each superior place is in value twelve times that of its next inferiour. This way of conceiving an unit to be divided, is chiefly in use among artificers, who generally take the linear dimensions of their work in feet, inches, and twelfth parts. When artificers square their dimensions, duodecimals are multiplied into duodecimals, and the operation is popularly called cross-multiplication. The following is the rule: Under the multiplicand, write the corresponding denominations of the multiplier, as in the annexed example. Multiply each term in the multiplicand, beginning at the lowest, by the feet in the multiplier, and write the result of each under its respective term, observing to carry an unit for every twelve, from each lower denomination to its next superior. In the same manner, multiply all the multiplicand by the prime in the multiplier, and set the result of each term one place removed to the right hand of those in the multiplicand. Do the same with the seconds in the multiplier, setting the result of each term two places removed to the right hand of those in the multiplicand. Proceed in like manner with all the rest of the denominations, and their sum will give the answer required.

$$
\begin{array}{rrrrr}
10f. & 4i. & 6s. & & \\
7\,. & 8\,. & 6\,. & & \\
\hline
72 & 6 & 11 & & \\
6 & 10 & 11 & 4 & \\
 & 5 & 2 & 2 & 6 \\
\hline
79f. & 11i. & 0s. & 6'''. & 0^{iv}. \\
\hline
\end{array}
$$

Note. Artificers in general estimate the second place of the product as really inches, the third as seconds, &c. which is erroneous: the figures in the second place denote rectangles of a foot long, and an inch broad, which are to be added to the inches standing in the third place; in like manner, the fourth place are rectangles of an inch long, and one-twelfth broad; the fifth place denote square twelfths. Hence the inches in the above product are not 11, but $\overline{11\times12}+0=132$, and the square parts are $\overline{6\times12}+6=78$.

DUODE'CUPLE. *a.* (*duo* and *decuplus*, Lat.) Consisting of twelves (*Arbuthnot*).

DUODE'NUM. (*duodenum*, from *duodenus*, consisting of twelve.) So called, because it was supposed not to exceed the breadth of twelve fingers; but the ancients, who gave it this name, dissected only quadrupeds, or at least drew their knowledge of anatomy from the structure of quadrupeds chiefly; and hence it does not strictly apply to the human subject: the first of the small intestines.

DUPE. *s.* (*dupe*, French.) A credulous man; a man easily tricked (*Swift*).

To DUPE. *v. a.* To trick; to cheat (*Pope*).

DU PIN (Lewis Ellis), a learned French writer. He was born at Paris in 1657, and after going through a regular education, was received a doctor of the Sorbonne in 1684. About this time he commenced his Bibliotheque Universelle des Auteurs Ecclésiastiques; the title of which, in 1686, on occasion of some complaints, he was obliged to alter to Bibliotheque Nouvelle. Besides this great work, which is a body of ecclesiastical history, he wrote a great number of others, but all on theological subjects. He died at Paris in 1719.

DU'PLE. *a.* (*duplex*, Lat.) Double; one repeated.

DUPLE AND SUB-DUPLE RATIO, among mathematicians; the first applied to numbers in the ratio of 2 to 1; the last to those in the ratio of 1 to 2.

DUPLICATE RATIO, is the ratio of the squares of two quantities: thus the duplicate ratio of a to b, is the ratio of a^2 to b^2. The sub-duplicate ratio, is that of the square roots; thus the subduplicate of a to b, is $\sqrt{a}$ to $\sqrt{b}$, or $a^{\frac{1}{2}}$ to $b^{\frac{1}{2}}$.

To DU'PLICATE. *v. a.* (*duplico*, Latin.) 1. To double; to enlarge by the repetition of the first number or quantity (*Glanville*). 2. To fold together.

DU'PLICATE. *s.* Another correspondent to the first; a second thing of the same kind, as a transcript of a paper (*Woodward*).

DUPLICA'TION. *s.* (from *duplicate*.) 1. The act of doubling (*Hale*). 2. The act of folding together. 3 A fold; a doubling (*Wiseman*).

Duplication of a cube, is the finding of the side of a cube which shall be double in solidity to a given cube. This cannot be effected geometrically, as it requires the solution of a cubic equation, or requires the finding of two mean proportionals, viz. between the side of the given cube and the double of the same, the first of which two mean proportionals is the side of the double cube, as was first observed by Hippocrates of Chios.

This celebrated problem was often attempted by the ancient geometricians; being first proposed by the oracle of Apollo at Delphos: this oracle, being consulted as to the manner of stopping a plague which then raged at Athens, returned for answer, that the plague should cease when Apollo's altar, which was cubical, should be doubled. Hence this obtained the name of the Delian problem. For more on this subject, we refer to Hutton's Ozanam, vol. i. p. 340.

DU'PLICATURE. *s.* (from *duplicate.*) A fold; any thing doubled (*Ray*).

Duplicature, in anatomy, a doubling or folding of membranes, or other like parts. Such are the duplicatures of the peritonæum, of the omentum, of the pleura, &c.

DUPLI'CITY. *s.* (*duplicis*, Lat.) 1. Doubleness; the number of two (*Watts*). 2. Deceit; doubleness of heart or of tongue.

DUPONDIUS, in antiquity, a weight of two pounds, or a money of the value of two ases. See As.

DU'RA MATER. (from *durus*, hard, and *mater*, a mother, called *dura*, from its hardness compared with the *pia mater*, and *mater*, from its being supposed to be the source of all the other membranes.) Dura meninx. Dermatodes. A thick membrane, formed of two layers, that surrounds and defends the brain, and adheres strongly to the internal surface of the cranium. It has three considerable processes, the falciform, the tentorium, and the septum cerebelli; and several sinusses, of which the longitudinal, lateral, and inferior longitudinal are the principal.

Dura meninx. See Dura mater.

DURABI'LITY. *s.* (*durabilis*, Lat.) The power of lasting; continuance (*Hooker*).

DU'RABLE. *a.* (*durabilis*, Lat.) 1. Lasting; having the quality of long continuance (*Raleigh*). 2. Having successive existence (*Milton*).

DU'RABLENESS. *s.* Power of lasting (*Addison*).

DU'RABLY. *ad.* (from *durable.*) In a lasting manner (*Sidney*).

DURALE, or Durate', a musical term, which is applied to whatever offends the ear by its effect.

DURAMPOUR, a town of the Deccan of Hindustan, in the province of Guzarat. Lat. 20. 32 N. Lon. 73. 14 E.

DURANCE, a river of France, which rises in the Alps, and falls into the Rhone, three miles below Avignon.

Du'rance. *s.* (from *duresse*, law French.) 1. Imprisonment; the custody or power of a jailer; a prison (*Congreve*). 2. Endurance; continuance; duration (*Dryden*).

DURA'NTA, in botany, a genus of the class didynamia, order angiospermia. Calyx five-cleft, superior; corol funnel-form, five-cleft; berry one-celled, containing four two-celled nuts. Three species; natives of the West Indies and South America: shrubs with blue flowers, and yellow fruit.

DURA'TION. *s.* (*duratio*, Latin.) 1. A sort of distance or length, the idea whereof we get from the fleeting and perpetually perishing parts of succession (*Locke*). 2. Power of continuance (*Rogers*). 3. Length of continuance (*Addison*).

Duration, as marked by certain periods and measures, is what we usually call time.

1. By observing certain appearances at regular, and seemingly equidistant periods, we get the ideas of certain lengths and measures of duration, as minutes, hours, &c. 2. By being able to repeat those measures of time, as often as we will, we come to imagine duration where nothing really endures, or exists: thus we imagine to-morrow, next year, yesterday, &c. 3. By being able to repeat such idea of any length of time, as of a minute, year, &c. as often as we will, and add them to one another, without ever coming to an end, we get the idea of eternity.

Time is to duration, as place is to space, or expansion. They are so much of those boundless oceans of eternity and immensity, as is set out, and distinguished from, the rest; and thus they serve to denote the position of finite, real beings, in respect of each other in those infinite oceans of duration and space.

Duration of action, according to Aristotle, is confined to a natural day in tragedy; but the epopoeia, according to the same critic, has no fixed time.

Duration of an eclipse. See Eclipse.

Duration of plants, the continuance of their life or existence; as caducous, or quickly perishing; ephemeral, creatures of a day; annual, biennial, perennial.

DURAZZO, a town of Albania, in European Turkey, and the see of a Greek archbishop. It is 50 miles N. of Valona. Lat. 41. 54 N. Lon. 19. 19 E.

DURBY, a town of Luxemburg, in Germany, which was ceded to France, in 1698. Lat. 58. 18 N. Lon. 5. 28 E.

To DURE. *v. n.* (*duro*, Latin.) To last; to continue (*Raleigh*).

DU'REFUL. *a.* (from *dure* and *full.*) Lasting; of long continuance: not in use (*Spenser*).

DU'RELESS. *a.* (from *dure.*) Without continuance; fading: not in use (*Raleigh*).

DURER (Albert), an eminent painter and engraver, born at Nuremberg in 1471. His first work was the three Graces, which was engraved in 1497. He engraved more than he painted, so that his pictures are wonderfully scarce and highly valued. In the palace at Prague is a piece by him representing Adam and Eve, and another of Christ bearing the cross. The people of Nuremberg still shew, with pride, in the senator's hall, his portraits of Charlemagne and some other emperors. However, he has gained the greatest name by his engravings, which are numerous and valuable. He was very excellent, too, in his engravings upon wood; but he was not, as has been often asserted, the first who practised that kind of engraving; since traces of it are met with more than a century before his time. The emperor Maximilian had a great regard for him, and conferred on him a pension and patents of nobility. He died at Nuremberg in 1528. Durer wrote a book on the Rules of Painting, and some other works, particularly Institutes of Geometry, published in 1532.

DURE'SSE. *s.* (French.) 1. Imprisonment; constraint. 2. (In law.) A plea used, by way of exception, by him who, being cast into prison at a man's suit, or otherwise by threats, &c. hardly used, seals any bond to him during his restraint.

D'URFEY (Thomas), a facetious English poet, born at Exeter, in 1628. He wrote a great number of plays and songs, all of which are tinged with the licentiousness of the reign of Charles II. who used to treat our bard with great familiarity. He resided frequently with the earl of Dorset at Knole, where is a portrait of him painted when he was asleep after dinner, for Tom had such an ordinary visage, that he could not bear to have his likeness taken. His ballads, &c. were printed in six vols. 12mo. under the title of Pills to purge Melancholy. He died in 1723.

DURHAM, the capital of the bishopric of Durham, with a market on Saturday, and a bishop's see. It is a considerable place, having six parish churches, besides the cathedral: it has 1054 houses, and 7530 inhabitants. It has a manufactory of shalloons, tabbies, and calamancoes. Lat. 54. 40 N. Lon. 1. 27 W.

The bishopric of Durham is deemed the richest bishopric in the kingdom; and the prebends are frequently styled the golden prebends of Durham. The diocese contains the whole counties of Durham and Northumberland, except the jurisdiction of Hexham in the latter. It hath also one parish in the county of Cumberland: making in the whole 135 parishes, whereof 87 are impropriate. The see is valued in the king's books at 2821*l.* 1*s.* 5¼*d*, but is computed to be worth annually 8700*l.* The clergy's tenths amount to 385*l.* 5*s.* 6½. It has two archdeacons, viz. of Durham and Northumberland. This see hath given to the church of Rome eight saints and one cardinal; and to the English nation one lord chief justice, five lord chancellors, three lord treasurers, one principal secretary of state, one chancellor to the university of Oxford, and two masters of the rolls.

Durham, a county of England, commonly called the bishopric of Durham, bounded on the N. by Northumberland, from which it is separated on the N.E. by the river Tyne; on the E. by the German ocean; on the S. and S.W. by Yorkshire and the river Tees; and on the W. by Westmorland and Cumberland. It extends 37 miles from N. to S. and 47 from E. to W. It is situated in the diocese of its own name, and contains one city, seven market-towns, and 113 parishes, but sends only four members to parliament. This county contains 28,366 houses, 160,360 inhabitants, and about 1,240,000 acres of land, one-tenth of which are uncultivated, including woodlands. The soil is very various. The chief rivers are the Were, Tees, Tyne, and Derwent. This county furnishes 492 men to the national militia.

DU'RING. *prep.* For the time of the continuance of; while any thing lasts (*Locke*).

DU'RIO, in botany, a genus of the class polyadelphia, order polyandria. Calyx five-cleft, cap-shaped, interior; petals five, small; style one; stamens in five sets, each consisting of seven; pome five-celled. One species only; an East-Indian tree, with alternate leaves; flowers in loose heads, beneath the leaves, of a yellowish white hue, and producing a large fruit.

DU'RITY. *s.* (*dureté*, French.) Hardness; firmness (*Wotton*).

DURO'GA, in botany, a genus of the class hexandria, order monogynia. Calyx superior, cylindrical, truncate; corol with a cylindrical tube and six-parted border as long as the tube; pome bristly. One species; a Surinam tree, with branches hairy at the tip; leaves terminal, opposite, obovate, very entire, pubescent above; flowers terminal, sessile, clustered; fruit rather larger than a turkey's egg, well flavoured.

DUROTRIGES, an ancient British nation, seated in that part of the country which is now called Dorsetshire. Their name is derived from the two British words *Dur*, water, and *Trigo*, to dwell; and it is no less evident that they got their name from the situation of their country, which lies along the sea coast. It is not very certain whether the Durotriges formed an independent state under a prince of their own, or were united with their neighbours the Danmonii; as they were reduced by Vespasian under the dominion of the Romans, at the same time, and with the same ease, and never revolted.

DURSLEY, a town in Gloucestershire, with a market on Thursdays. It is chiefly inhabited by clothiers. Lat. 51. 40 N. Lon. 2. 23 W.

DURST. The preterit of *dare*.

DURUM, a musical term, applied to one of the tetrachords in Guido's scale.

DUSK. *a.* (*duyster*, Dutch.) 1. Tending to darkness. 2. Tending to blackness; dark-coloured (*Milton*).

Dusk. *s.* (from the adjective.) 1. Tendency to darkness; incipient obscurity (*Spectator*). 2. Darkness of colour (*Dryden*).

To **Dusk.** *v. a.* To make darkish.

To **Dusk.** *v. n.* To grow dark; to begin to lose light; to have lustre diminished.

DU'SKILY. *ad.* (from *dusky*.) With a tendency to darkness or blackness.

DU'SKISH. *a.* (from *dusk*.) 1. Inclining to darkness; tending to obscurity (*Spenser*). 2. Tending to blackness (*Wotton*).

DU'SKISHLY. *ad.* Cloudily; darkly (*Bacon*).

DU'SKY. *a.* (from *dusk*.) 1. Tending to darkness; obscure (*Prior*). 2. Tending to blackness; dark-coloured; not clear; not bright (*Newton*). 3. Gloomy; sad; intellectually clouded (*Bentley*).

DUSSELDORP, a strong town of Westphalia, in Germany. It was taken by the Hanoverian forces in 1758; but belongs at present to the elector Palatine. Lat. 51. 12 N. Lon. 6. 52 E.

DUST. *s.* (ꝺuꞅꞇ, Saxon.) 1. Earth or other matter reduced to small particles (*Bacon*). 2. The grave; the state of dissolution (*Milton*). 3. A mean and dejected state (*Samuel*).

To DUST. *v. a.* (from the noun.) 1. To free from dust. 2. To sprinkle with dust.

DU'STMAN. *s.* One whose employment is to carry away the dust (*Gay*).

DU'STY. *a.* (from *dust*.) 1. Filled with dust; clouded with dust (*Dryden*). 2. Covered or scattered with dust (*Thomson*).

DU'TCHESS. *s.* (*duchesse*, French.) 1. The lady of a duke (*Swift*). 2. A lady who has the sovereignty of a dukedom.

DU'TCHY. *s.* (*duché*, French.) A territory which gives title to a duke (*Addison*).

DU'TCHY-COURT. *s.* A court wherein all matters appertaining to the dutchy of Lancaster are decided (*Cowell*).

DU'TEOUS. *a.* (from *duty*.) 1. Obedient; obsequious (*Prior*). 2. Obedient to good or bad purposes (*Shakspeare*). 3. Enjoined by duty: not in use (*Shakspeare*).

DU'TIFUL. *a.* (*duty* and *full*.) 1. Obedient; submissive to natural or legal superiours; reverent (*Swift*). 2. Expressive of respect; giving token of reverence; reverential (*Sidney*).

DU'TIFULLY. *ad.* (from *dutiful*.) 1. Obediently; submissively. 2. Reverently; respectfully (*Sidney*).

DU'TIFULNESS. *s.* (from *dutiful*.) 1. Obedience; submission to just authority (*Dryden*). 2. Reverence; respect (*Taylor*).

DUTLINGEN, a town of Suabia, in Germany, belonging to the duke of Wurtemburg. Lat. 48. 10 N. Lon. 9. 2 E.

DU'TY. *s.* (from *due*.) 1. That to which a man is by any natural or legal obligation bound (*Luke*). 2. Acts or forbearances required by religion or morality (*Taylor*). 3. Obedience or submission due to parents, governours, or superiours (*Decay of Piety*). 4. Act of reverence or respect (*Spenser*). 5. The business of a soldier on guard (*Clarendon*). 6. The business of war; service (*Dryden*).

DUTY, in polity and commerce, signifies the impost laid on merchandises, at importation or exportation, commonly called the duties of customs; also the taxes of excise, stamp-duties, &c. See CUSTOMS, EXCISE, &c.

There is no task more delicate or difficult to a statesman than the laying on of duties or imposts. Experience teaches us that a very small duty laid on commodities raises the price of them considerably to the consumer, beyond the gross duty. By the fees given to officers; by trademen's loss of time in attending upon excisemen, or at custom-houses; by taking away a portion of our traders' stock for duties; and forcing them to take as great pains on one part of their stock laid out in goods, in order to live, as they would on the whole, if duty-free; by tradesmen's profits on the duty, and advances in all the hands that all taxed goods come through to the consumer: as for example, suppose there should be no other tax but that on leather, let us see how many advances that would make on the price of shoes.

The grazier lays (1) on the beast he fats, his advanced price of shoes: he sells to the butcher, who takes (2) his profit on the grazier's advanced price of the beast; and raises (3) on the hide his advanced price of shoes: he sells to the tanner, whose journeymen raise (4) their wages, on account of the advanced price of shoes; the tanner pays (5) the tax on the leather; takes (6) his profit on the before-mentioned five advances, and raises (7) his advanced price of shoes on the tanned hide: he sells to the leather-cutter, who takes (8) his profit on the before-mentioned seven advances, and raises (9) on the hide he cuts, his advanced price of shoes: he sells to the shoemaker, whose journeymen raise (10) their wages, on account of their advanced price of shoes; the shoemaker takes (11) his profit on the before-mentioned ten advances, and raises (12) on the shoes he makes the advanced price of the shoes he wears: he sells to the consumer with all these twelve advances, highly magnified beyond the bare duty.

DUVAL (Peter), geographer-royal of France, born at Abbeville, and died at Paris in 1683, aged 65. He was the nephew of the celebrated Sanson, and published a number of treatises and maps; the best known of his works is La Geographie Françoise, &c.

DUVAL (Nicholas), a Dutch painter, born in 1644, and died in 1732. He studied in Italy to great advantage under Pietro da Cortona, whose manner he adopted. He was greatly employed by king William III. who appointed him director of the academy at the Hague.

DUUMVIRATE, the office or dignity of the duumviri. The duumvirate lasted till the year of Rome 388, when it was changed into a decemvirate. See DECEMVIRI.

DUUMVIRI, in Roman antiquity, a general appellation given to magistrates, commissioners, and officers, where two were joined together in the same functions. Thus, *duumviri capitales*, were the judges in criminal causes: *duumviri municipales*, two magistrates in some cities of the empire, answering to what the consuls were at Rome: *duumviri navales*, commissaries of the fleet: *duumviri sacrorum*, those who regulated the sacrifices, and kept the Sibyl's books.

DUX, in music, the name formerly given to the leading voice or instrument in a fugue. (*Busby*).

DWARF. *s.* (ꝺƿeoꞃᵹ, Saxon.) 1. A man below the common size of men (*Brown. Milton*). 2. Any animal or plant below its natural bulk (*L'Estrange*). 3. An attendant on a lady or knight in romances (*Spenser*). 4. It is used often by botanists in composition: as, dwarf-elder, dwarf-honeysuckle.

In the Philosophical Transactions we have well authenticated accounts of two dwarfs; one born in Norfolk, who, at the age of twenty-two, weighed no more than thirty-four pounds with all his clothes on, and whose height, including hat, wig, and shoes, was only thirty-eight inches; and another in Wales, who, at the age of fifteen, measured no more than two feet seven inches, and weighed only thirteen pounds; and who at that early period of life laboured under all the infirmities and calamities of very old age. Phil. Trans. vol. xlvi. p. 67, and vol. xlvii. p. 279.

To Dwarf *v. a.* To hinder from growing to the natural bulk (*Addison*).

DWA'RFISH. *s.* (from *dwarf.*) Below the natural bulk; low; small; little (*Bentley*).

DWA'RFISHLY. *ad.* Like a dwarf.

DWA'RFISHNESS. *s.* (from *dwarfish.*) Minuteness of stature; littleness (*Glanville*).

To **DWELL.** *v. n.* preterit *dwelt*, or *dwelled*. (*duelia*, Islandick, to stay.) 1. To inhabit; to live in a place; to reside; to have a habitation (*Leviticus*). 2. To live in any form of habitation (*Hebrews*). 3. To be in any state or condition (*Shakspeare*). 4. To be suspended with attention (*Smith*). 5. To continue long speaking (*Swift*).

To Dwell. *v. a.* To inhabit: not used (*Milton*).

DWE'LLER. *s.* (from *dwell.*) An inhabitant; one that lives in any place (*Bacon*).

DWE'LLING. *s.* (from *dwell.*) 1. Habitation; abode (*Dryden*). 2. State of life; mode of living (*Daniel*).

DWE'LLINGHOUSE. *s.* The house at which one lives (*Ayliffe*).

DWINA, the name of two large rivers; one of which rises in Lithuania, and, dividing Livonia from Courland, falls into the Baltic sea a little below Riga: the other gives name to the province of Dwina in Russia, discharging itself into the White sea, a little below Archangel.

To **DWI'NDLE.** *v. n.* (ꝺƿınan, Saxon.) 1. To shrink; to lose bulk; to grow little (*Addison*). 2. To degenerate; to sink (*Swift*). 3. To wear away; to grow feeble (*Gay*). 4. To fall away; to moulder off (*Clarendon*).

DYADIC ARITHMETIC. See Arithmetic.

DYE, in architecture. (See Dado.) In general it denotes any cubical body. See Die.

DYEING (Art of.) *l'art de la teinture*, French; *farbekunst*, German. The art of fixing with uniformity and permanency certain colouring materials into the fibres of wool, linen, and cotton, silk, felt, ivory, and other fibrous or filamentous substances. We shall consider this important art as briefly as possible, under the divisions of its history, theory, and process.

History of Dyeing.

Few of the arts have a claim to a higher antiquity; and still fewer of them, important as are the benefits which have been conferred upon it by recent chemistry, attained in ancient times so near an approach towards perfection. It certainly preceded painting, itself of very high antiquity, and appears to have been known in the earliest ages of the Jews, the Babylonians, and the Egyptians: and "nothing can exceed the judgement," observes Mr. Good in his Notes on Lucretius, vol. ii. p. 159, "with which they selected colours for stuffs, cottons, linens, or silks, or what answered the purpose of silks, when colours were their object in view; or the dexterity with which they applied them. These were extracted from the animal, vegetable, and mineral kingdom; and without confining themselves to cloths or silks, they dyed with equal elegance and effect, leathers, ivory, tortoise-shell, the hair of animals, woods, earths, wax, and even stones and marbles."

As soon, however, as the art of painting had attained some degree of proficiency, and the mere outline or silhouette, after having been at first filled up with an interior shade by means of the crayon (which Pliny ascribes to a Corinthian or Sicyonian artist as the inventor of this method), had been enriched by an application of the natural colours of the object intended to be delineated, the art of dyeing was united to that of painting, and the needle was as extensively employed upon colours as the pencil. "Embroidery and tapestry, in which colours were introduced," observes the author from whom we have just quoted, vol. ii. p. 51, "we know to have been of high antiquity among the Jews and Babylonians; but both these arts presuppose the existence of outlines or linear drawings, for the artist necessarily worked from a pattern. The history of Pandion, king of Athens, and of his daughter Philomela, who informed Progne of her misfortunes by describing them on tapestry, may, perhaps, be fabulous. Be this, however, as it may, we know that the fable is of very remote origin; and, as is related by Apollodorus, was probably the production of one of the Cyclic poets. According to this admirable mythologist, Philomela did not indeed paint her history, but embroidered it in characters on a veil. Yet at the period when this fable was invented, we can scarcely conceive that embroidery was confined to the exhibition of characters alone; it was unquestionably employed, and with more freedom, in the art of tracing and designing. In the time of Homer, however, we have undoubted proof of the application of tapestry to the dignity of historical subjects. Iris, in the third book of the Iliad, finds Helen occupied in representing on tapestry the evils which the Greeks and Trojans had suffered on her account in their battles. Such an undertaking, even supposing it were executed in cammeo, or with a single colour, evinces a considerable perfection of the art she was practising. But the Trojans are stated to have been also acquainted with the mode of intermixing different colours in their tapestries. When Andromache learned the death of Hector, she was at work in a retired part of her palace, and representing, in tapestry, flowers of a variety of tinctures.

Αλλ' ηγ' Ιστον υφαινε μυχω δομου ὑψηλοιο,
Διπλακα, μαρμαρεην, εν δε θρονα ποικιλλ' επασσε.

"Far in the close recesses of the dome,
Pensive she ply'd the melancholy loom;
A growing work employed her secret views,
Spotted diverse with intermingled hues."
POPE.

So Lucretius himself, as a full proof that a knowledge of the art of dyeing was common to the Romans in his early æra, lib. iv. 1023.

Quom Babylonica, magnifico splendore, rigantur.

"Wetting the rich and Babylonian dye."

Upon which, observes Mr. Good, "the Babylon here referred to was a city of Egypt, at no great distance from Cairo: it was universally celebrated, during its prosperity, for its very beautiful embroideries, and more particularly the richness and magnificence of its purple colour, extracted from the murex by a process peculiar to itself. In consequence of this circumstance, and at the same time of the exorbitant price charged for its introduction, it became by far the most fashionable tincture in all the tapestries, carpets, counterpanes, and sofa coverings, of the opulent and luxurious of Greece and Rome.

"The splendid and durable dye obtained from this valuable shell-fish of the old world is known by history to every one. A full account of it, however, to those who are desirous of more explicit information, may be obtained by consulting Pliny, ix. 38, who intimates that, either from a variety in the fish employed, or in the mode of manufacturing the colour, it occasionally exhibited a considerable difference of tincture, and was hence denominated rose-purple, violet-purple, hyacinth purple. The first appears to have been held in the highest estimation; the rose, however, being rather darker in its hue than we commonly meet with it; in which case the murex was nigrantis rosæ sublucentem." Id. p. 577.

The antiquity of the art of dyeing may still farther be collected from the perfection to which this art has been carried immemorially throughout Hindustan, Ceylon, and especially China; and still more decisively so from the coloured and figured cloths, found not only in Mexico, but in Otaheite, on their first discovery. Perhaps that of Otaheite is most in point; for here, unquestionably, the webb and woof were dyed antecedently to their being woven, while in the former place the cloths, skins, and barks, were for the most part painted upon, rather than imbued with the colouring materials. Yet the accuracy and perfection of the Mexicans in the art of colouring, whether by dyeing or painting, at the period in which their country was first discovered by Europeans, is truly astonishing. D'Acosta informs us, that on the arrival of the Spanish squadron on their coast, expresses were immediately sent to Montezeuma, with exact representations of the ships painted on cloth; and by means of this kind of picture-writing, he adds, they kept their records, histories, and calendars; representing things that had bodily shapes in their proper figures; and those that had none in arbitrary significant characters. From the specimens of Mexican hieroglyphics preserved in the Bodleian library, the colouring materials appear to be drawn chiefly from the mineral kingdom, and to be earths rather than animal or vegetable substances.

Theory of Dyeing.

The first explanation offered upon this subject was purely mechanical. It was observed that some colouring matters united readily with the cloth, or other substance to be dyed, and became fixed in them, without any other material being employed for this purpose; but that others would only adhere when intermixed with a third substance; and it was also observed, that the intermediate substance, thus necessary, was for the most part a salt of some kind or other; as for instance, soda or alum. And hence Hellot, an excellent observer and acute reasoner, and one of the earliest who attempted to explain the mode by which the saline material acted, asserted that it was a direct mordant, that it eroded or bit its way into the fibres to be dyed, and thus by opening or enlarging their pores, enabled the colouring matter to be deposited in them. After which these same fibres, from a degree of natural elasticity, contracted and shut in the particles of colouring matter; while the salts employed, solidifying over them, served as a kind of cement to preserve them in their place.

Insuperable objections, however, have been advanced against this and similar mechanical theories of dyeing, upon which we cannot enter in detail. We shall only observe, that it is peculiarly incompetent to explain the great difference between animal and vegetable matter in absorbing and retaining colour, and the use of mordants or intermedes, as a bond of union between the colour and the fibre to be dyed. Bergman appears to have been the first whose eminent sagacity suggested the idea, that chemical affinity was the great agent in these operations; and every subsequent research more and more confirms this opinion.

The substances commonly dyed are either of animal or vegetable origin. To the former belong wool, silk, hair, leather, and skin of all kinds; to the latter cotton, flax, and hemp. The particular chemical analysis and properties of these substances, as far as they have been examined, will be described under the respective articles. A most important and essential difference exists between the affinity for colouring matter possessed by these substances, so that a process which perfectly succeeds in dyeing wool (for example) may have no effect upon cotton, neither is there any agreement in the quantity of colouring ingredient necessary to dye each stuff.

A simple experiment of Dufay's proves this. He had a piece of cloth woven, of which the warp was wool, and the woof cotton; this was fulled, that each substance might undergo exactly the same preparation, and then passed through a scarlet vat. The wool only took the colour, but the cotton remained white after rinsing. With regard to quantity of colour, it is found that silk takes twice as much cochineal to dye it as wool does. The different force of affinity between different fibres and colouring matter, is also shewn by the more or less perfect manner in which they exhaust a coloured bath; thus, as Bergman observes, wool dyed in a weak solution of sulphat of indigo, entirely absorbs the dye, and leaves the solution colourless; whereas silk can only partially rob the sulphuric acid of the colouring matter. Generally speaking, wool has the strongest affinity for colour, taking it more easily, and retaining it more firmly; silk, and other animal matters, come next to wool, cotton next, and hemp and flax last; but this is to be understood with great latitude, nor does it always happen that substances which take colour the easiest retain it the longest, besides that the previous preparation is not the same; and hence the comparison is not altogether accurate.

No exact explanation can be given of the different affinity for colour in different substances, except that the analysis of vegetable and animal matters shews a most essential difference in their component parts, and their habitudes with chemical re-agents. It is on this account, too, that the preparation which each substance receives previously to being dyed so much varies. Animal matter, especially wool, when immersed in caustic alkali, has its fibre immediately relaxed, becomes clammy, loses its natural toughness and elasticity, and at last is entirely dissolved into a soapy compound. Vegetable fibre, on the other hand, resists alkalies much longer, and is not easily dissolved; and hence in the previous cleansing and fulling of wool, alkalies are scarcely admissible, or must be used with extreme caution, whereas they may be employed with safety in the preparation of cotton and linen. Animal fibre is also much more easily affected by acids. The simple colours employed in dyeing are chiefly of animal or vegetable origin. The number of possible dyes is almost equal to that of the vegetable or insect tribes on the face of the earth, for almost all of these will make a coloured decoction with water, which is capable of tinging cloth immersed in it. Hence the variety of native dyes from indigenous plants, used in different parts of the globe by every nation, savage or civilized. A very few, however, are employed in the regular manufactories of European nations, being such as are obtained in the most abundance from countries where they form valuable articles of commerce, and whose qualities are minutely known by long and accurate observation. Of the great variety of known dyes, some (though comparatively but few) may be applied to animal or vegetable fibre, without any other preparation than that of cleansing the stuff, and immersing it in a decoction or infusion of the dye for a sufficient time. The colouring matter then unites with the fibre of the cloth with a greater or less degree of force, so as sometimes permanently to resist the effect of washing; while the bleaching power of the sun and air acts sometimes partially, sometimes scarcely at all. On the other hand, the greater number of dyes have naturally only a very feeble affinity for fibre, (though never in the same degree for animal and vegetable) and, therefore, when applied without adddition, they are destroyed very speedily; but the ingenuity of man has discovered, that they may be made to unite with fibre, much more durably, by the intermede of some other substance (generally a salt with an alkaline, earthy, or metallic basis), which possesses a very strong affinity both with fibre and with colouring matter, and hence serves to bind the one to the other. These intermedes, as we have already observed, are called mordants (a term derived from an erroneous theory now abandoned) and the usual practice is first to steep the cloth or fibre in the mordant, and afterwards in the dye.

The dyes that cannot be fixed into the stuff without mordants may be termed (with Dr. Bancroft) adjective colours; those in which mordants are of no use may be called substantive colours. Madder is an adjective colour, since it is rendered much more durable by the intermede of alum, or of many other salts than when used alone. Indigo is a substantive colour, since its durability is not increased by any intermede whatever.

Another important difference in the nature of dyes is in the degree of permanence of tint, which certainly in part depends on the force of affinity with which it unites to the fibre, and partly on the intimate nature of the colouring matter, and its susceptibility of decomposition by light, air, moisture, and also by alkalies, soaps, and other substances employed in the common uses of dyed stuffs. The permanency of colour has no necessary connexion with the mode in which it is united to the substances dyed, for among the substantive, as well as the adjective colours, some are very permanent, others very fugitive, for example, of the substantive colours (or those which unite as strongly to cloth without as with mordants). Indigo is very permanent, resisting the sun, air, washing with soap, and most chemical agents. The oriental henne, which is a fine orange red, long resists the sun and air, but is altered and destroyed by soap: archil, and other of the purple lichens, is instantly altered by soap, and is soon changed by the light and air, so as only to give a very fugitive, but beautiful gloss. Of the adjective colours, madder is one of the most permanent that is known, retaining its body of colour (when well applied) under almost every circumstance. Cochineal, or wool, is nearly equally fast or permanent, but on cotton much less so. Brazil wood fades much sooner than the last, whatever mordant be applied. The selections and right application of mordants, is of infinite consequence in dyeing; and it is this subject, with its various modifications, that forms the truly scientific part of this beautiful art. Linen or cotton requires a different mordant from wool or silk; some colours adhere only to a particular mordant: the order of application, the strength, and many other smaller circumstances, all of which materially affect the beauty and durability of the colour, and the texture of the cloth, must be attended to by the artist.

Some simple experiments related by Dr. Bancroft, and which are readily repeated, will illustrate the action of mordants. A piece of cotton was impressed with various figures, with a mordant of acetited alumine, and when dry, was rinsed and cleansed in the usual way of calico-printing. It was then dyed in an infusion of saffron, and came out uniformly yellow; but on exposure to air, the whole became white. Hence it is shewn, both that the colouring matter of saffron has no strong affinity with cotton, and that alumine has no power of fixing it; and hence is useless as a mordant. The same piece was then dyed with a decoction of Brazil wood, and the whole came out coloured, but the figures printed with the aluminous solution were of a fine crimson, whereas the ground was only faintly tinged. On exposure to the sun and air for two days, the ground soon became white, and the figures also were faded; and in eight days the crimson of the latter, which had been gradually diminishing, was no longer visible. This second experiment shews that acetited alumine is a powerful mordant for Brazil wood, but still not sufficient finally to fix its colour.

The same piece was then dyed with a decoction of madder, and the whole came out coloured, but the figures deeper than the ground. On washing with bran and water, and exposure to sun and air, the ground became white, but the figures retained all their body and brightness of colour, and this time the dye was permanent, shewing in a very striking manner the strong affinity both of the alumine for the cotton, so as to remain fixed in its fibres during three successive operations, and of the alumine for the madder colour, so as to retain it permanently, in spite of the washings and bleaching, which entirely destroyed the dye of the ground.

Mordants not only fix colouring matter, but most commonly they in some degree alter the natural hue. Thus in the instance above-mentioned, the aluminous mordant changed the dull red of madder to a bright crimson; the solutions of tin not only fix the colour of cochineal in wool, but change it from a crimson to a bright scarlet: the salts of iron, which are powerful mordants, always alter the colour of dyes, changing the yellow of weld to olive brown, drab, or lead colour, according to circumstances, the red of madder to a violet brown, and, as is well known, striking a blueish black whenever the gallic acid is present. Hence a great advantage is most ingeniously made of mixing different kinds of mordants to produce varieties of shade: thus a mixture of the iron and aluminous mordant will produce with madder all the shades of pea colour, purple, and violet; with weld, brown, and olive green, and the like, so that with no more than three or four colouring materials an almost infinite variety of dyes may be produced, by a due selection and mixture of the various mordants.

Process of Dyeing.

The art of dyeing implies two distinct kinds of manufacture, plain dyeing, or dyeing in the piece, which consists of one uniform colour, diffused over the entire substance to be dyed, and calico-dyeing, or the fixing a variety of coloured patterns on an uniform ground, denominated calico-dyeing, because calico or cotton is the material usually employed for this purpose. The basis of each manufacture is nearly the same; the particular mode of application being that in which they chiefly vary. We have already pointed out the principal manipulations in the latter manufacture, under the article CALICO-PAINTING, to which we refer our readers, and shall now proceed to offer a few remarks upon plain dyeing, or dyeing in the piece.

Mordants.—We have already observed, that the selection and proper use of these intermedes is of infinite consequence in dyeing.

Almost the only substances used as mordants are earths, metallic oxyds, tan, and oil.

Of earthy mordants the most important, and most generally used, is alumina. It is used either in the state of common alum, in which it is combined with sulphuric acid, or in that of acetite of alumina.

Alum, when used as a mordant, is dissolved in water, and very frequently a quantity of tartar is dissolved along with it. Into this solution the cloth is put, and kept in it till it has absorbed as much alumina as is necessary. It is then taken out, and for the most part washed and dried. It is now a good deal heavier than it was before, owing to the alumina which has combined with it. The tartar serves two purposes; the potass which it contains combines with the sulphuric acid of the alum, and thus prevents that very corrosive substance from injuring the texture of the cloth, which otherwise might happen: the tartareous acid, on the other hand, combines with part of the alumina, and forms a tartrit of alumina, which is more easily decomposed by the cloth than alum.

Acetit of alumina has been but lately introduced into dyeing. This mordant is now prepared by pouring acetit of lead into a solution of alum; a double decomposition takes place, the sulphureous acid combines with the lead, and the compound precipitates, in the form of an insoluble powder, while the alumina combines with the acetous acid, and remains dissolved in the liquid. This mordant is employed for cotton and linen, which have a weaker affinity than wool for alumina; it answers much better than alum; the cloth is more easily saturated with alumina, and takes, in consequence both a richer and a more permanent colour.

Besides alumina, lime is sometimes used as a mordant. Cloth has a strong affinity enough for it; but, in general, it does not answer so well, as it does not give so good a colour. When used, it is either in the state of lime-water, or of sulphate of lime dissolved in water.

Almost all the metallic oxyds have an affinity for cloth, but only two of them are extensively used as mordants, namely, the oxyds of tin and of iron.

The oxyd of tin was first introduced into dyeing by Kuster, a German chemist, who brought the secret to London in 1543. This period forms an æra in the history of dyeing. The oxyd of tin has enabled the moderns greatly to surpass the ancients in the fineness of their colours; by means of it alone, scarlet, the brightest of all colours, is produced.

Tin, as Proust has proved, is capable of two degrees of oxydation. The first oxyd is composed of 0. 70 parts of tin, and 0. 70 of oxygen; the second, or white oxyd, of 0. 60 parts of tin, and 0. 40 of oxygen. The first oxyd absorbs oxygen with very great facility, even from the air, and is rapidly converted into white oxyd. This fact makes it certain, that it is the white oxyd of tin alone which is the real mordant; even if the other oxyd was applied to cloth, as it probably often is, it must soon be converted into white oxyd, by absorbing oxygen from the atmosphere.

Tin is used as a mordant in three states: dissolved in nitro-muriatic acid, in acetous acid, and in a mixture of sulphuric and muriatic acids. Nitro-muriat of tin is the common mordant employed by dyers. They prepare it by dissolving tin in diluted nitric acid, to which a certain proportion of muriate of soda (common salt), or of ammonia (sal ammoniac), is added. Part of the nitric acid decomposes these salts, combines with their base, and sets the muriatic acid at liberty. It was prepared at first with nitric acid alone, but that mode was very defective, because the nitric acid very readily converts tin to white oxyd, and then is incapable of dissolving it; the consequence of which was, the precipitation of the whole of the tin. To remedy this defect, common salt, or sal ammoniac, was very soon added; muriatic acid having the property of dissolving white oxyd of tin very readily. A considerable saving of nitric acid might be obtained, by employing as much sulphuric acid as is just sufficient to saturate the base of the common salt, or sal ammoniac, employed.

When the nitro-muriat of tin is to be used as a mordant, it is dissolved in a large quantity of water, and the cloth is dipped in the solution, and allowed to remain till sufficiently saturated. It is then taken out, and washed and dried. Tartar is usually dissolved in the water along with the nitro-muriat. The consequence of this is a double decomposition: the nitro-muriatic acid combines with the potass of the tartar, while the tartareous acid dissolves the oxyd of tin. When tartar is used, therefore, in any considerable quantity, the mordant is not a nitro-muriat, but a tartrit of tin.

Iron, like tin, is capable of two degrees of oxydation; but the green oxyd absorbs oxygen so readily from the atmosphere, that it is very soon converted into the red oxyd. It is only this last oxyd which is really used as a mordant in dyeing. The green oxyd is, indeed, sometimes applied to cloth; but it very soon absorbs oxygen, and is converted into the red oxyd. This oxyd has a very strong affinity for all kinds of cloth. The permanency of the iron-spots on linen and cotton is a sufficient proof of this. As a mordant, it is used in two states; in that of sulphat of iron (copperas), and acetit of iron. The first is commonly used for wool. The salt is dissolved in water, and the cloth dipped in it. It may be used also for cotton, but in most cases acetite of iron is preferred. It is prepared by dissolving iron, or its oxyd, in vinegar, sour beer, &c. and the longer it is kept, the more it is preferred. The reason is, that this mordant succeeds best when the iron is in the state of red oxyd. It would be better then to oxidate the iron, or convert it into rust, before using it; which might be easily done, by keeping it for some time in a moist place, and sprinkling it occasionally with water.

Tan has a very strong affinity for cloth, and for several colouring matters; it is therefore very frequently employed as a mordant. An infusion of nut-galls, or of sumach, or any other substance containing tan, is made in water, and the cloth is dipped in this infusion, and allowed to remain till it has absorbed a sufficient quantity of tan. Silk is capable of absorbing a very great proportion of tan, and by that means acquires a great increase of weight. Manufacturers sometimes employ this method of increasing the weight of silk.

Tan is often employed also, along with other mordants, in order to produce a compound mordant. Oil is also used for the same purpose, in the dyeing of cotton and linen. The mordants with which tan most frequently is combined are alumina, and oxyd of iron.

Besides these mordants, there are several other substances frequently used as auxiliaries, either to facilitate the combination of the mordant with the cloth, or to alter the shade of colour; the chief of these are, tartar, acetit of lead, common salt, sal ammoniac, sulphat or acetit of copper, &c.

Mordants not only render the dye permanent, but have also considerable influence on the colour produced. The same colouring matter produces very different dyes, according as the mordant is changed. Suppose, for instance, that the colouring matter is cochineal; if we use the aluminous mordant, the cloth will acquire a crimson colour; but the oxyd of iron produces with it a black.

In dyeing, then, it is not only necessary to procure a mordant which has a sufficiently strong affinity for the colouring matter and the cloth, and a colouring matter which possesses the wished-for colour in perfection, but we must procure a mordant and a colouring matter of such a nature, that, when combined together, they shall possess the wished-for colour in perfection. It is evident too, that a great variety of colours may be produced with a single dye-stuff, provided we can change the mordant sufficiently.

The colouring matter with which the cloth is dyed does not cover every portion of its surface; its particles attach themselves to the cloth at certain distances from each other; for cloth may be dyed different shades of the same colour, lighter or darker, merely by varying the quantity of colouring matter. With a small quantity, the shade is light; and it becomes deeper as the quantity increases. Now this would be impossible, if the dye-stuff covered the whole of the cloth.

That the particles of colouring matter, even when the shade is deep, are at some distance, is evident from this well-known fact, that cloth may be dyed two colours at the same time. All those colours to which the dyers give the name of compound are in fact two different colours applied to the cloth at once. Thus cloth gets a green colour, by being first dyed blue and then yellow.

Such being the mordants chiefly employed, we shall now enter upon a consideration of the dyes chiefly communicated. In doing which we shall considerably simplify the art by observing that innumerable as are the different colours and shades of colours communicated, they all originate from four or five primary dyes modified according to the colour intended to be produced. These primary, or simple dyes, are as follow—blue, yellow, red, black, and fawn, or as this last is sometimes called, root or brown colour.

Of Blue.—The only two substances employed in dyeing blues are woad and indigo: the former being a fecula or dried pulp made of the fermented leaves and stem of the isatis tinctoria, in its nature not unlike indigo, and very commonly used along with indigo in dyeing woollens: the latter a peculiar preparation produced by a fermentation of the leaves of the indigo fera tinctoria, and one or two varieties of the same genus; for the process by which this substance is obtained, see INDIGO and INDIGOFERA.

Indigo has a very strong affinity for wool, silk, cotton, and linen. Every kind of cloth, therefore, may be dyed with it, without the assistance of any mordant whatever. The colour thus induced is very permanent; because the indigo is already saturated with oxygen, and because it is not liable to be decomposed by those substances, to the action of which the cloth is exposed. But it can only be applied to cloth in a state of solution; and the only solvent known being sulphuric acid, it would seem at first sight, that the sulphuric acid solution is the only state in which indigo can be employed as a dye.

The sulphat of indigo is indeed often used to dye wool and silk blue; but it can scarcely be applied to cotton and linen, because the affinity of these substances for indigo is not great enough to enable them readily to decompose the sulphate. The colour given by sulphate of indigo is exceedingly beautiful; it is known by the name of Saxon blue.

One part of indigo is to be dissolved in four parts of concentrated sulphuric acid; to the solution one part of dry carbonate of potass is to be added, and then it is to be diluted with eight times its weight of water. The cloth must be boiled for an hour in a solution, containing five parts of alum, and three of tartar, for every 32 parts of cloth. It is then to be thrown into a water-bath, containing a greater or smaller proportion of the diluted sulphat of indigo, according to the shade which the cloth is intended to receive. In this bath it must be boiled till it has acquired the wished-for colour.

The alum and tartar are not intended to act as mordants, but to facilitate the decomposition of the sulphat of indigo. The alkali added to the sulphat, answers the same purpose. These substances also, by saturating part of the sulphuric acid, serve in some measure to prevent the texture of the cloth from being injured by the action of the acid, which is very apt to happen in this process.

But sulphat of indigo is by no means the only solution of that pigment employed in dyeing. By far the most common method is, to deprive indigo of the oxygen, to which it owes its blue colour, and thus to reduce it to the state of green pollen; and then to dissolve it in water by means of alkalis, or alkaline earths, which in that state act upon it very readily.

Two different methods are employed for this purpose. The first of these methods is, to mix with indigo a solution of some substance which has a stronger affinity for oxygen than the green basis of indigo; green oxyd, for instance, and different metallic sulphurets. If therefore indigo, lime, and green sulphat of iron, are mixed together in water, the indigo gradually loses its blue colour, becomes green, and is dissolved; while the green oxyd of iron is converted into the red oxyd. The manner in which these changes take place is obvious; part of the lime decomposes the sulphat of iron; the green oxyd, the instant that it is set at liberty, attracts oxygen from the indigo, decomposes it, and reduces it to the state of green pollen. This green pollen is immediately dissolved by the action of the rest of the lime.

The second method is, to mix the indigo in water with certain vegetable substances, which readily undergo fermentation. During this fermentation, the indigo is deprived of its oxygen, and dissolved by means of quick-lime or alkali, which is added to the solution. The first of these methods is usually followed in dyeing cotton and linen; the second, in dyeing wool and silk.

In the dyeing of wool, woad and bran are commonly employed as vegetable ferments, and lime as the solvent of the green base of the indigo. Woad itself contains a colouring matter precisely similar to indigo; and by following the common process, indigo may be extracted from it. In the usual state of woad, when purchased by the dyer, the indigo which it contains is probably not far from the state of the green pollen. Its quantity in woad is but small, and it is mixed with a great proportion of other vegetable matter.

When the cloth is first taken out of the vat, it is of a green colour; but it soon becomes blue, by attracting oxygen from the air. It ought to be carefully washed, to carry off the uncombined particles. This solution of indigo is liable to two inconveniences: first, it is apt sometimes to run too fast into the putrid fermentation; this may be known by the putrid vapours which it exhales, and by the disappearing of the green colour. In this state it would soon destroy the indigo altogether. The inconvenience is remedied by adding more lime, which has the property of moderating the putrescent tendency. Secondly, sometimes the fermentation goes on too languidly. This defect is remedied by adding more bran or woad, in order to diminish the proportion of quick-lime.

Silk is dyed light-blue by a ferment of six parts of bran, six of indigo, six of potass, and one of madder. To dye it of a dark blue, it must previously receive what is called a ground-colour; a red dye-stuff, called archil, is used for this purpose.

Cotton and linen are dyed blue by a solution of one part of indigo, one part of green sulphat of iron, and two parts of quick-lime.

Of Yellow.—This colour is obtained amongst ourselves, from a variety of vegetable materials; the extractive part of most plants, indeed, affording a yellow, or a yellowish hue. Weld (roseda luteola), is the substance chiefly employed; next to this old fustic (the bois jauné of the French, or morus tinctoria of the Linnéan system); next to this quercitron bark (quercus nigra of Linnéus), first introduced into this country as a dye by Dr. Bancroft, though in common use for this purpose in the countries in which it is indigenous. These three constitute our chief yellows. Besides which, however, we shall just mention that our dyers have occasionally recourse to young fustic, or Venice sumach (the fustet of the French, or rhus cotinus of Linnéus); saw-wort (serratula tinctoria); dyer's broom (genista tinctoria); Avignon, or French berry (graine d'Avignon); and American golden rod (solidago Canadensis).

Upon these we shall observe, that the greater part of them give a very fugitive colour, and especially the French berry; and that the colour of none of them can be made perfectly fast.

Yellow colouring matters, therefore, have too weak an affinity for cloth to be employed without the use of mordants: and hence cloth, before it is dyed yellow, is always prepared by combining some mordant or other with it. The mordant most commonly employed for this purpose is alumina. Oxyd of tin is sometimes used when very fine yellows are wanting. Tan is often employed as a subsidiary to alumina, and in order to fix it more copiously on cotton and linen. Tartar is also used as an auxiliary, to brighten the colour; and muriat of soda, sulphat of lime, and even sulphat of iron, in order to render the shade deeper.

The yellow dyed by means of fustic is more permanent, but not so beautiful as that given by weld, or quercitron. As it is permanent, and not much injured by acids, it is often used in dyeing compound colours, where a yellow is required. The mordant is alumina. When the mordant is oxyd of iron, fustic dyes a good permanent drab colour.

Weld and quercitron bark yield nearly the same kind of colour; but as the bark yields colouring matter in much greater abundance, it is much more convenient, and upon the whole, cheaper than weld. It is probable, therefore, that it will gradually supersede the use of that plant. The method of using each of these dye-stuffs is nearly the same.

Wool may be dyed yellow by the following process: Let it be boiled for an hour or more with about one-sixth of its weight of alum, dissolved in a sufficient quantity of water. It is then to be plunged, without being rinsed, into a bath of warm water, containing in it as much quercitron bark as equals the weight of the alum employed as a mordant. The cloth is to be turned through the boiling liquid, till it has acquired the intended colour. Then a quantity of clean powdered chalk, equal to the hundredth part of the weight of the cloth, is to be stirred in, and the operation of dyeing continued for eight or ten minutes longer. By this method a pretty deep and lively yellow may be given, fully as permanent as weld yellow.

For very bright orange or golden yellow, it is necessary to have recourse to the oxyd of tin as a mordant.

For producing bright golden yellows, some alum must be added along with the tin.

In order to give the yellow that delicate green shade, so much admired for certain purposes, tartar must be added in different proportions, according to the shade.

By adding a small proportion of cochineal, the colour may be raised to a fine orange, or even an aurora.

Silk may be dyed different shades of yellow, either by weld or quercitron bark, but the last is the cheapest of the two. The proportion should be from one to two parts of bark, to twelve parts of silk, according to the shade. The bark, tied up in a bag, should be put into the dyeing vessel, while the water which it contains is cold; and when it has acquired the heat of about 100°, the silk, having been previously alumed, should be dipped in, and continued till it assumes the wished-for colour. When the shade is required to be deep, a little chalk or pearl-ash should be added towards the end of the operation.

The best method of dyeing cotton and linen yellow is with a mordant, consisting of acetit of alumina, prepared by dissolving one part of acetit of lead, and three parts of alum, in a sufficient quantity of water, heating the solution to the temperature of 100°. The cloth should be soaked in the dye for two hours, and then hung out and dried; when the soaking and drying should be repeated; after which it is to be barely wetted with lime-water, and then dried once more: the number of repetitions of the entire process is to depend upon the brightness of the dye required. The dyeing bath is prepared by putting twelve or eighteen parts of quercitron bark (according to the brightness required) tied up in a bag, into a sufficient quantity of cold water. Into this the cloth is to be plunged, and turned round in it for an hour, while its temperature is gradually raised to about 120°. It is then to be advanced to a boiling heat, and the cloth allowed to remain in it after that only a few minutes. If it be kept long at a boiling heat, the yellow will acquire a shade of brown.

Of Red.—The materials employed for this colour are lac or kermes, cochineal, archil, madder, carthamus, and Brazil-wood.

The first is the secretion of an insect of the coccus genus, and the second is the dried substance of another species of the same genus. Both these are used very largely by the dyers of India, and especially in Bangalore, as is also the carthamus. The mordant they employ is a ley, made of a solution of impure soda and quicklime; and the colours they produce, though differing in the peculiar tint, according to the material made use of, are in almost every instance deeply bright and beautiful. Among ourselves, alum is more commonly employed, especially in the two former instances; it brightens the colour of the decoction, and produces a crimson precipitate. Muriat of tin gives a copious fine red precipitate.

Archil is a paste formed of a species of lichen, pounded and kept moist for some time with stale urine.

Madder is the root of the RUBIA TINCTORUM, for which see that article.

Carthamus is the flower of the carthamus tinctorius, which is cultivated in the southern parts of Europe, and thrives nearly as well as in India. It contains two colouring matters; a yellow, which is soluble in water, and a red, insoluble in water, but soluble in alkaline carbonats. The red colouring matter of carthamus, extracted by carbonat of soda, and precipitated by lemon juice, constitutes the rouge employed by ladies as a paint. It is first ground, however, with a certain quantity of talc.

Brazil-wood is the trunk of a species of cæsalpinia, indigenous to America and the West Indies, for which see CÆSALPINIA. Its decoction offers a very fine red colour.

Woollen stuffs, of a coarser description, are dyed red with madder; but fine cloth is almost exclusively dyed with cochineal, though the colour it receives from lac or kermes, if less bright, is more durable. All our old tapestries owe their enduring scarlets to this material. Brazil-wood is scarcely used, except as an auxiliary; the colour which it imparts to wool is fugitive.

Dr. Bancroft recommends a method of dyeing scarlet, in which a much smaller portion of cochineal produces an equal effect. He conceived scarlet, from his experiments, to be a compound colour, caused by about three-fourths of crimson or rose colour, and one-fourth of pure bright yellow. He therefore supposed that when the natural crimson of the cochineal is made scarlet, by the usual process, a fourth of the colouring matter of the cochineal must be changed from its natural crimson to a yellow colour, by the action of the solution of tin. For this reason he introduced a bright yellow dye into the bath with the cochineal, and reduced the quantity of this more expensive ingredient. He also found that a mixture of two pounds of sulphuric acid, with about three pounds of muriatic acid, poured on fourteen ounces of granulated tin, with exposure to heat, produced a solution of tin, that had twice the effect of the common nitro-muriatic solution, at less than a third of the expense, and which raised the colours more, without producing a yellow shade. For the yellow dye, Dr. Bancroft used quercitron bark. His process for dyeing scarlet, by the use of this substance, and the above preparation of tin, is as follows:

An hundred pounds of cloth are to be put into a tin vessel, nearly filled with water, in which about eight pounds of the murio-sulphuric solution of tin have been previously mixed. The liquor is made to boil, and the cloth is turned through it by the winch for a quarter of an hour in the usual manner. The cloth is then taken out, and four pounds of cochineal, with two pounds and a half of quercitron bark in powder, put into the bath and well mixed. The cloth is then returned into the liquor, which is then made to boil, and the operation is continued, as usual, till the colour be duly raised, and the dyeing liquor exhausted, which will usually happen in about fifteen or twenty minutes; after which the cloth may be taken out and rinsed as usual. In this method the labour and fuel necessary for the second bath are saved; the operation is finished in much less time; all the tartar will be saved, as well as two-thirds of the expense of the solvent for the tin, and, at least, one-fourth of the cochineal usually employed; and the colour produced will not be inferior, in any respect, to that dyed with so much more expense and trouble in the ordinary way; and, moreover, looks much better than it by candle-light.

A rose colour may be readily and cheaply dyed by the above process, by only omitting the quercitron bark.

Crimson is produced either by dyeing the wool this colour at once, or by first dyeing it scarlet, and then changing the shade to that required. To dye crimson by a single process, a solution of two ounces and a half of alum, and an ounce and half of tartar, are employed in the boiling for every pound of the stuff, for each of which also an ounce of cochineal is to be afterwards used in dyeing it. It is customary to employ solution of tin, but in smaller proportion than for dyeing scarlet. To render the crimson deeper, and give it more bloom, archil and potash are frequently used, but this bloom is extremely fugacious.

To produce a crimson from a scarlet, the alkalies, alum, and earthy salts, are used, all of which have this effect. Crimson is the natural colour of the cochineal, and to produce it from a stuff dyed scarlet, the stuff is boiled for an hour in a solution of alum, the strength of which is to be regulated by the depth of shade required.

Silks may be coloured by madder, by means of a mixt mordant of alum and solution of tin; but after all, the hues are seldom sufficiently bright, though by this mode they obtain durability; and hence cochineal and carthamus are usually had recourse to.

Crimson produced on silk by cochineal is called grain crimson, to distinguish it from a colour called false crimson, dyed with Brazil wood. For the grain crimson, the silk being well cleansed from soap at the river, is to be immersed for a night in alum liquor of the full strength; it is then to be washed, and twice beetled at the river. The bath is prepared by filling a long boiler two-thirds with water, to which is added, when it boils, from half an ounce to two ounces of powdered white galls for every pound of silk. When it has boiled for a few moments, from two to three ounces of cochineal, powdered and sifted, are put in for every pound of silk, and afterwards one ounce of tartar for every pound of cochineal. When the tartar is dissolved, one ounce of solution of tin is added for every ounce of tartar. Macquer recommends this solution of tin to be made by dissolving six ounces of fine grain tin, with two ounces of sal ammoniac, in a pound of nitric acid, diluted with twelve ounces of water. When these ingredients are mixed together, the boiler is to be filled with cold water, the proportion of which, for every pound of silk, is about eight or ten quarts. In this bath the silk is to be immediately immersed, and turned on the winch till it appears of an uniform colour; the fire is then increased, and the bath is kept boiling for two hours, taking care to turn the silk occasionally; the fire is afterwards put out, and the silk immersed in the bath, where it is suffered to remain a few hours longer; it is then taken out, washed at the river, twice beetled, and dried.

To obtain other shades of red, the above processes must be varied. If, after the silk has been wrung out of the solution of tin, it is steeped for a night in a cold solution of alum, in the proportion of one ounce to a quart of water, wrung, dried, then washed and boiled with cochineal, it will appear of a pale poppy colour. But a fine poppy-red may be procured by steeping it twelve hours in the solution of tin, diluted with eight parts of water, then leaving it all night in the solution of alum, after which it is to be washed, dried, and passed through two baths of cochineal, taking care to add to the second bath a small quantity of sulphuric acid.

The colour that comes nearest to scarlet has been produced on silk, by first dyeing it crimson, and then dyeing it with carthamus, and afterwards submitting it to a yellow bath without heat. The colour thus given is very fine, but the dye of carthamus is not permanent. In Dr. Bancroft's process, the silk is soaked for two hours in a solution of tin, in the murio-sulphuric acid, after which it is wrung out and dried partially. It is then to be dyed in a bath prepared with four parts of cochineal, and three of quercitron bark. In this way a colour approaching to scarlet is obtained. To give the colour more body, the immersion may be repeated in the solution of tin, and in the dyeing bath: the brightness of the scarlet is increased by the addition of carthamus. A lively rose colour is produced by omitting the quercitron bark, and dyeing with the cochineal alone.

Cotton may be dyed scarlet, by means of murio-sulphat of tin, cochineal, and quercitron bark, used as for silk, but the colour is too fading to be of any value.

Of Black.—The substances employed to give a black colour to cloth are, red oxyd of iron, and tan. These two substances have a strong affinity for each other; and when combined assume a deep black colour, not liable to be destroyed by the action of air or light.

Logwood is usually employed as an auxiliary, because it communicates lustre, and adds considerably to the fullness of the black. It is the wood of the hæmatoxylon, a native of several of the West India islands, and of that part of Mexico which surrounds the bay of Honduras. It yields its colouring matter to water. The decoction is at first a fine red, bordering on violet; but if left to itself, it gradually assumes a black colour. Acids give it a deep red colour; alkalies a deep violet, inclining to brown; sulphat of iron renders it as black as ink, and occasions a precipitate of the same colour.

Cloth, before it receives a black colour, is usually dyed blue: this renders the colour much fuller and finer than it would otherwise be. If the cloth be coarse, the blue dye may be too expensive; in that case, a brown colour is given, by means of walnut-peels.

The proportions used by the English dyers are, for every hundred pounds of woollen cloth, dyed first of a deep blue, about five pounds of sulphat of iron, five pounds of galls, and thirty of logwood. They begin with galling the cloth, and then pass it through the decoction of logwood, to which the sulphat of iron has been added.

Some recommend fine cloths to be fulled with soap-suds; but this operation requires an experienced workman to cleanse the cloth perfectly of the soap. Many advise to give the cloth a dip in a bath of weld when it comes from the fulling mill, which they say softens it, and fixes the black. Lewis says, the weld bath is totally useless when the cloth has been treated with soap-suds, though in other cases it may be of advantage. He ascribes its effects entirely to the alkali with which the dyers commonly prepare its decoction.

The leaves of the uva ursi may be employed instead of galls. They must be carefully dried in autumn, so that they may remain green. When they are to be used, 100 pounds of wool are boiled for two hours with sixteen pounds of sulphat of iron, and eight of tartar: the day following, the cloth is to be rinsed as after aluming: 150 pounds of uva ursi are then to be boiled in water for two hours, and after their being taken out, a little madder is to be added to the liquor, at the same time putting in the cloth, which is to remain there an hour and a half, or an hour and three quarters, after which it is to be rinsed in water. This process gives a pretty good black to blue cloth, but only a deep brown to white: the madder and tartar are supposed by Lewis to be useless.

Silk is dyed black by a process not very different from that used in dyeing cloth. It imbibes tan freely; which is given to it at the pleasure of the artist, by allowing the silk to remain a longer or shorter time in the decoction. Not less than sixty pounds of silk are commonly dyed at one operation; and a considerable degree of harshness is produced in the dyeing: it is afterwards plunged into a strong solution of soap in water, in which it remains for about a quarter of an hour; after which it is wrung out and dried.

It is by no means easy to give a full black to linen or cotton; and still less so a durable black, the colour generally yielding to the action of soap. The cloth, previously dyed blue, is to be steeped for twenty-four hours in a decoction of nut-galls. Then prepare a bath, containing an acetite of iron, formed by saturating acetous acid with brown oxyd of iron; into this bath plunge the cloth in small quantities at a time, and work it with the hand for a quarter of an hour; then wring it out and air it again; after which let it be again worked in the bath, and once more wrung out and aired. These alternate processes are to be repeated till the requisite colour is procured: a decoction of alder bark is usually mixed with the liquor containing the nut-galls.

Of Brown, or Fawn Colour, Buff, and Nankeen.—Various substances, and of easy acquisition, are employed to give a brown, or fawn-coloured ground. Santal, or saunders wood, was formerly employed; birch, alder bark, and sumach, are occasionally used; but the more common is a decoction of walnut peels, or walnut root.

Santal, or saunders wood, is much inferior to walnut shells; because, if used in too large a quantity, it stiffens, and consequently injures the wool. It is in general mixed with galls, sumach, and alder bark, without which its colour could not be extracted: and though it yields very little with alum and tartar, it is nevertheless used in large quantities, on account of the solidity of its colour, which is naturally a yellow-reddish brown.

The best of the different ingredients employed in dyeing fawn-colours is the bark or rind of the walnut-tree. Its shades are uncommonly fine; its colours solid; and it renders the wool dyed in it flexible and soft. A cauldron half full of water is placed over the fire; and as soon as it grows warm, bark is added in proportion to the quantity of stuffs intended to be dyed, and the lightness or depth of the shades required. It is then boiled for about a quarter of an hour, when the cloths, being previously moistened with warm water, are immersed, frequently turned, and well stirred, till they have sufficiently imbibed the colour. They are aired, dried, and dressed in the usual manner.

Next to the rind or bark, the root of the walnut-tree is the best dye for a fawn-colour: it also affords a variety of shades, similar to those produced by the bark, for which it is frequently substituted. The root, however, requires a different process: a cauldron is filled about three parts full of river-water, into which the root is immersed, after being tied up in a bag. When the liquor is very hot, the wool or stuff is plunged into it, repeatedly turned, and occasionally aired. The lighter stuffs are next to be dipped, till the colour is completely extracted. During this operation, proper care should be taken to prevent the liquor from boiling, as in such case the piece first immersed would imbibe the whole of the colour.

The process of dyeing with the bark of alder is nearly the same as that pursued with walnut roots: the boiling of it is at first not very material, as this drug very freely communicates its colour. It is chiefly used for worsteds, imparting shades darkened with copperas; and for wool that is not required to be very dark, as it equally withstands the effects of the sun and rain.

Sumach possesses nearly the same properties as the bark or rind of the walnut-tree; its colour is not so deep, somewhat inclining to green, but is solid and permanent. Where dark colours are required, sumach is frequently substituted for nut-galls, in which case a greater proportion becomes necessary. These different substances, however, are not unfrequently mingled together, and, as they are of a similar nature, and differ only in degree, it is easy to obtain various shades.

Of derivative or compound Colours.—Every one knows that a great multiplicity of colours is imparted to cloths and silks besides those we have just taken notice of. All these, however, proceed from a mixture or modification of the above dyes, which on this account, as we have already remarked, are denominated primitive or simple dyes. Of these compound dyes, we shall notice a few of the principal.

Of Green.—This under the dyer's, as often under the painter's hands, is a mixture of blue and yellow, the shade varying according to the prevalence of either of the compound parts; whence we have sea-green, grass-green, pea-green, and a variety of others. The blue is generally first employed as a dye, and afterwards the yellow; for it is a well known fact, that the yellow is much more apt to separate in the blue vat, than the blue in the yellow vat. When sulphat of indigo is employed, it is usual, however, to mix all the ingredients together, and to dye the cloth at once: it is this dye that produces the Saxon or English green.

Violet, purple and lilac.—These are all mixtures of blue and red; and depend upon the different shade produced by the proportion of the one colour to the other. Wool, cotton and linen, are first dyed blue; and the two last are then galled and soaked in a decoction of logwood; but a more permanent colour is given by means of oxyd of iron; they are then dyed scarlet in the usual manner. By means, however, of cochineal, mixed with the sulphat of indigo, the process may be performed at once. Silk is first dyed crimson by means of cochineal, and then dipped into the indigo vat.

Orange.—This is a mixture of yellow and red.

Olive.—If blue be added to the above mixture of yellow and red, the result will prove an olive colour. Wool may be dyed orange, by first dyeing it scarlet, and then yellow. If first dyed with madder, the produce will be cinnamon colour. Silk is dyed orange by means of carthamus, cinnamon colour by logwood, Brazil wood, and fustic, mixed together. Cotton and linen are rendered cinnamon-hued by means of weld and madder; and olive-hued by being passed through a blue, yellow, and finally a madder-vat.

Greys, Drabs, and dark Browns. These are all mixtures of black with other colours. If cloth be previously combined with brown oxyd of iron, and afterwards dyed yellow with quercitron bark, the result will be a drab of different shades, according to the proportion of mordant employed. When the proportion is small, the colour has a tendency to olive or yellow; on the contrary, the drab may be deepened or saddened, as the dyers term it, by mixing a little sumach with the bark.

DYER (John), an English poet, born in 1700, at Aberglasney in Caermarthenshire, and educated at Westminster school. He was bred to the law under his father, but that profession he abandoned for painting. To perfect himself he went to Italy, where he projected his beautiful poem, entitled, The Ruins of Rome, which he published in 1740. He had before favoured the public with an elegant descriptive piece called Grongar Hill. Not long after his return he entered into orders, and obtained the living of Calthorp in Leicestershire, which he exchanged in 1757 for Belchford in Lincolnshire. He also had the rectory of Coningsby in the same county, to which was afterwards added Kirkby-on-Bane. In 1757 appeared the Fleece, a poem, which possesses great merit. He died the year following, and was buried at Coningsby. Mr. Dyer left a widow and four children.

DYER'S BROOM, in botany. See GENISTA.

DYER'S WEED. See GENISTA and RESEDA.

DYING. (the participle of *die.*) Expiring, giving up the ghost.

DYNAMICS. (from δυναμις, power.) Is that branch of mechanics which has for its object the action of forces on solid bodies, when the result of that action is motion; and in which, since all motion occupies some portion of time, we introduce time into our investigations. This department of science presents a wide and varied field of discussion, and when viewed in its full extent it exhibits many questions of considerable difficulty: we shall not attempt to give the whole of these, as such a procedure would draw us far beyond the limits which must be assigned to this part of the work.

The sum of the material particles of which a body is composed, is what we denote by the word *mass*. This mass depends on the volume of the body and that which we call density. We have already observed (art. DENSITY) that density is directly as the quantity of matter, and inversely as the magnitude of the body: but it will not be improper to deduce concisely the general theorem which comprises this relation. To this end it must be considered that as all bodies are penetrated with a great number of void spaces or pores, their quantity of matter is not proportional to their volume; but under the same volume there will be more or less matter as the particles are nearer or further asunder; and we say that a body has a greater or less density, according as there subsists a greater or less proximity between its moleculæ. Thus we say a body is more dense than another when in an equal volume the former contains more matter than the latter: we say, on the contrary, that it is less dense or more rare (for density and rarity are reciprocal qualities) when in an equal volume it comprises less matter. The density serves, therefore, to judge of the number of material particles when the volume is known: thus we may regard the density as representing the number of equal moleculæ in a determinate volume; as when, for example, we say that gold is 19 times denser than water, we wish to be understood that gold contains 19 times the number of particles that water does in the same space.

Since we represent the density as expressing the number of moleculæ in a determinate volume which we assume as the unit of magnitude; it is obvious that to obtain the mass, or the total number of moleculæ, of any body of which the magnitude is known, we must take the rectangle of the density and magnitude. Thus, if we represent generally the body or mass by B, its volume or magnitude by M, and its density by D, we shall have $B = MD$: whence it will be easy to compare the masses, the magnitudes, and the densities of bodies.

In similar bodies the masses are as the densities and cubes of the diameters, or depths, or lengths, or of any like linear dimensions. Hence, if L denote the lineal dimension, we readily deduce these general proportions:

$$B \propto MD \propto DL^3.$$

$$M \propto \frac{B}{D} \propto L^3.$$

$$D \propto \frac{B}{M} \propto \frac{B}{L^3}.$$

$$L \propto \sqrt[3]{\frac{B}{D}} \propto \sqrt[3]{M}.$$

Force, according to our definition, is that which causes a change in the state of a body; or, it is that which either moves or tends to move a body: forces are no further known to us than by their effects; it is only therefore by the effect any force produces that we can measure it. Now the effect of a force is to give to every material particle of a body a certain velocity: if, therefore, all the parts of a body receive the same velocity, as we suppose here, the effect of the moving cause has for its measure the product of the velocity, into the number of moleculæ moved, or the product of the velocity and mass: a force therefore is proportional to the velocity which it can impress on a known mass, and that mass conjointly.

Def. Momentum, or quantity of motion, is the rectangle of the mass of a body and its velocity. See FORCE.

Consequently, forces are measured by the quantities of motion they are capable of producing.

Thus, if F denote the motive or moving force, B the body moved, and V the velocity imparted to it, w ehave $F \propto BV$. From this we deduce $V \propto \frac{F}{B}$, and $B \propto \frac{F}{V}$: therefore, 1. The velocity of a body in motion, is as the moving force directly, and the mass inversely. 2dly, The body or mass is as the moving force directly, and the velocity inversely.

If now two bodies be represented by B, and *b*, the forces by which they are moved by F, and *f*, and the velocities imparted to them by V and *v*, we have $F \propto BV$, and $f \propto bv$. Let B be supposed equal to b, then will $F \propto V$, and $f \propto v$: hence, when the masses are equal, the moving forces are as the velocities. Again, supposing $V=v$, we have $F \propto B$ and $f \propto b$: therefore, when the velocities are equal, the moving forces are as the masses. Lastly, making $F=f$, we have $\frac{1}{V} \propto B$, and $\frac{1}{v} \propto b$: consequently, when the moving forces are equal, the velocities are in the inverse ratio of the masses.

On Motion, uniform and variable.—The motion of a physical point, or of a body, is uniform when it moves always in the same manner, or when it passes over equal spaces in any equal intervals of time whatever. This motion, the most simple of all, and the most easy to conceive, probably exists in no part of nature, but is only a pure abstraction of the mind: it is, notwithstanding, important to consider it, because were it not for obstructions, motions in general would be uniform, and because it conduces greatly to the analysis of all other motions.

That affection of motion which we call velocity being measured by the space uniformly described in a given time, is in fact a measure of motion itself, and is that which characterises each species of uniform motion: it is customary in mathematical discussions to fix upon a small period of time, a second, for example, as a unit, and to call the velocity of a moving body at any instant the space which the body would describe uniformly during a unit of time.

Hence it follows, that in the uniform motion of a body the spaces run over are proportional to the times employed. For if it describe V feet in one second, it will describe 2V feet in two seconds, 3V feet in three seconds, and TV feet in T seconds, T being any number whole or fractional. This being granted, we may now state a proposition from which the whole doctrine of uniform motions will readily flow.

Prop. When bodies have different uniform motions, the spaces described are proportional to the times and velocities jointly.

Let V and v be the velocities of the two bodies B and b, T and t the times of their motions, S and s the spaces described, likewise let s' be the space described by b in the time T:

Then $S : s' :: V : v$

$s' : s :: T : t$

And, comp. $S : s :: TV : tv$. That is $S \propto TV$.

Cor. 1. The velocity is as the space divided by the time: for the preceding expression gives $V \propto \frac{S}{T}$. Or, since the same will hold in any corresponding indefinitely minute portions of the space and time, we shall have $V = \frac{\dot{S}}{T}$.

Cor. 2. The velocities of two bodies moving uniformly are directly as the spaces and inversely as the times: for we have $V : v :: \frac{S}{T} : \frac{s}{t}$.

Cor. 3. In equal times the velocities are proportional to the spaces run over: for $T=t$ gives $V : v :: S : s$.

Cor. 4. If the velocities are equal, the spaces passed over are proportional to the times: for $V=v$, gives $St=sT$, or $S : s :: T : t$.

Cor. 5. If the spaces passed over are equal, the velocities are reciprocally as the times: for when $S=s$, we have $V : v :: \frac{1}{T} : \frac{1}{t} :: t : T$.

Cor. 6. Since the areas of rectangles are in the ratio compounded of the ratios of their sides, if the bases represent the velocities of two motions, and altitudes the times, the areas will represent the spaces described.

Cor. 7. Since it has been shewn that the forces which give motion to bodies are proportional to their quantities of motion, and these to the rectangles of the masses and velocities, that is, $F \propto Q \propto BV$; we may, by combining this with the present proposition, have the following formulæ of relation of the six quantities, force F, momentum or quantity of motion Q, mass or quantity of matter B, time T, space S, and velocity V; the forces being supposed instantaneous or impulsive, and the motions uniform:

$$F \propto Q \propto BV \propto \frac{BS}{T}.$$

$$Q \propto F \propto BV \propto \frac{BS}{T}.$$

$$B \propto \frac{F}{V} \propto \frac{Q}{V} \propto \frac{FT}{S} \propto \frac{QT}{S}.$$

$$T \propto \frac{S}{V} \propto \frac{BS}{F} \propto \frac{BS}{Q}.$$

$$S \propto TV \propto \frac{TF}{B} \propto \frac{TQ}{B}.$$

$$V \propto \frac{S}{T} \propto \frac{F}{B} \propto \frac{Q}{B}.$$

Scholium. We have before said that we know nothing more of forces than by their effects in moving bodies: we call those equal forces, however different they may be in their nature, which give to bodies equal momenta, or which when the bodies are equal give to them equal velocities; and we say that forces are greater or less when they give to bodies greater or less momenta, or when they impress upon equal bodies greater or less velocities. Therefore when different forces act upon equal bodies, the forces are, *cæteris paribus*, proportional to the velocities imparted: the velocity then being proportional to the force, these two quantities may be represented the one by the other, and all which we have established on the composition and resolution of forces may be applied to the composition and resolution of velocities. Hence it might seem unnecessary to give here the demonstration of the most extensive proposition, as it relates to velocities and directions; but since it may be proved satisfactorily in small compass, and admits of two or three useful deductions, we are unwilling to omit it.

Prop. The simultaneous action of two impulsive forces P, P′, on a body A, which would impress upon it separately the velocities V, V′, in the directions AC, AC′, will cause that body to move uniformly over the diagonal of the parallelogram whose sides are in the directions of those forces.

Imagine that the body A (fig. 1. Pl. 55.) is placed on a plane ACC′ which moves uniformly in the direction AC′ with such a velocity as in each unit of time will carry it over a space equal to the line AC′: it is certain that this body considered with relation to the plane on which it is placed has no motion; yet if a spectator fixed immoveably out of that plane observes the body A, he will attribute to it a motion equal and parallel to that of the plane. Now, if we conceive that any impulsive force whatever, P, acts upon the body A in the direction PAC, and impresses upon it such a velocity that in a unit of time it would pass over a space equal to AC, there can be no doubt that if the body were acted upon by this force only it would be found at the point C at the termination of the unit of time. But since, in consequence of the motion of the plane, the line AC advances towards C′B by a motion uniform and parallel, so that it would really coincide with C′B at the end of a unit of time, it is obvious that the point C will then coincide with the point B, and that, of consequence, the body A which partakes of the motion of the plane ought to be found in B at the end of the first unit of time. We may prove, in like manner, that at the end of any part or multiple whatever, T, of this unit, the body A, animated with the same velocity AC, ought to run over a proportional space $Ac = T \times AC$, while the common motion constrains the line Ac to pass parallel to itself over a distance $Acc' = T \times AC'$. This line coincides, therefore, with $c'b$, and consequently b is the place of the body A at the end of the time T. And it is manifest that all the points b, b, that may be determined by the same reasoning, are found on the same diagonal AB, since $Ac : cb :: AC : CB$. The body A, therefore, actually describes the diagonal AB. But besides this, its motion along this line must be uniform: for $Ab : AB :: Ac : AC :: T \times AC : AC :: T : 1$; that is to say, Ab is to AB as the time employed in passing through Ab to that occupied in passing over AB. Consequently the motion of the body A along the diagonal AB is uniform. Since a body at rest on a moveable plane has the same motion as the plane, it is clear that if the plane were at rest, but that the body moved uniformly according to the right line P′AC′, with the velocity AC′ equal to that which would be impressed upon it by the force P′, and received at the point A from the force P a velocity AC in the direction PAC, it would describe uniformly the diagonal AB of a parallelogram formed upon the sides AC, AC′, which represent the velocities of the body in those respective directions, while the diagonal AB represents its new velocity. Q.E.D.

We may likewise shew that, if a body be acted on by two similar variable forces (for the same time) whose directions and magnitudes are expressed by the adjacent sides of a parallelogram concurring in the body, it will describe the diagonal of the parallelogram.

Let the forces act by impulses, at the beginning of equal particles of time, and let Ac', $c'C'$ $C''c$, and Ac, cC, Cc, be the relative magnitudes of corresponding impulses. Then by the action of the two first impulses the body will, by the preceding article, describe the diagonal Ab; and by the next two the diagonal bB, of the parallelogram dd', whose sides bd', bd, are equal and parallel to the representatives of those new impulses: but the forces are similar, therefore the parallelograms cc' dd', are similar; and, having parallel sides and a common point b, they exist about the same diagonal AB. The same may be shewn for a third pair of impulses: and so on, *ad libitum*. Let now the particles of time be evanescent and the forces incessant, and the same demonstration will obtain.

Cor. If the forces by which the body is urged in the directions AC, AC′, be not similar, it will move in some curve line, whose nature will depend on the relation of the forces. Of this many instances will occur as we proceed.

There remains another general theorem, which it will not be amiss to exhibit in this place, viz. If a number of bodies is moving in any manner whatever, and an equal force acts on each particle of matter in the same or parallel directions, their relative motions will not be affected.

The motion of any body A (fig. 2. Pl. 55.) with respect to another moving body B, is compounded of the real motion of A and the opposite to the real motion of B: for, let A move uniformly from A to C, while B moves uniformly from B to D; draw AE equal and parallel to BD, join AB, EC, DC, and ED. The motion of A with regard to B consists in its change of position and distance. If while A had described AE, B described BD, there would be no change of relative place or distance: but A is now at C, and DC is its new direction and distance: therefore, the relative or apparent motion of A is EC. Let the parallelogram ACFE be completed: then it is evident that the motion EC is compounded of EF, which is equal and parallel to AC, the real motion of A; and of EA, the equal and opposite to BD, the real motion of B.

Now let the motions of A and B sustain the same change; let the equal and parallel motions AG, BH, be compounded with the motions AC and BD; or, suppose forces to act at once on A and B, in the parallel directions AG, BH, and with equal intensities: on either supposition the resulting motions will be AC′, BD′, the diagonals of the parallelograms AGC′C, and BHD′D. Then constructing the figure as before, we see that the relative motion is E′C′, and that it is equivalent to EC both with respect to magnitude and direction.

Here we may again remark the constant analogy between the composition of motions and that of forces. In the former the relative motions of things are not changed, whatever common motion be compounded with them all: and in the latter the relative motions and actions are not changed by any external force, however considerable, when equally exerted on all the moleculæ in parallel directions.

By means of this it is that we account for the circumstance of the evolutions of a fleet in a uniform current being the same, with relation to the several ships, and produced by the same means, as in still water: also, that the motions and operations in a ship, sailing smoothly and regularly along, are performed in the same manner as though the vessel were at rest: and again universally, of all bodies included in a given space (for instance, those on the surface of the earth,) their motions amongst themselves will be the same, their congress the same, the force of their percussion the same, and all their mutual operations, whether the space they occupy is at rest, or whether it moves in a trajectory compounded of the diurnal and annual motions about the centre of the solar system; or lastly, whether these are combined with a motion about some far more distant centre of force.

II. *On Motions uniformly varied.*—A body which has received only a single impulsion will, according to the first law of motion, persevere in its motion with the same velocity and in the same direction it had at the first instant: but if it receives a new impulsion, either in the same direction or in a direction contrary to the first, it will then move with a velocity equal to either the sum or the difference of the two velocities which it received successively. If, therefore, we conceive that at successive intervals of time the body receives new impressions, either in the same or contrary directions, it will be transferred to different parts of space with a varied or unequal motion; its velocity will be different at the commencement of each interval of time. In variable motions the velocity undergoing repeated changes, it is usual to estimate it at any time whatever by the space it is capable of passing over during a unit of time, if its motion for that interval continued the same as at the instant where we would consider the velocity. Or in variable motions, the velocity of a body at any determinate instant is the space which it would run over in every unit of time, if at that instant the action of the power ceased, and the motion became uniform. Or, again, taking an infinitely minute interval of time, we may call the velocity of a moving body for that instant, the ratio of the infinitely little space described in that minute interval to its duration, or rather, the ultimate ratio of those two quantities.

Defs. We call in general any force which acts on a body so as to make it vary its motion an accelerating force: when, in equal intervals of time, it acts equably, or the velocity undergoes equal mutations, we call it a constant or uniform accelerating force, or a constant retarding force, according as it tends to augment or diminish the actual velocity of the moving body.

When a single body is acted upon by a constant force there are four quantities which become the objects of mechanical consideration, viz. the space described, the time of description, the velocity acquired, and the force which produces it; any three of which being given, the other may be ascertained. But when different forces act upon bodies of different masses, these are two additional quantities for consideration, making in the whole six kinds of magnitudes which affect the discussion.

Prop. The velocities generated in equal bodies by the action of constant forces are in the compound ratio of the forces and times of acting.

For, when the times are the same the velocities generated each instant are as the forces of acceleration, and consequently the velocities generated at the end of equal times are as those forces; and if the forces are the same the velocities generated are as the times wherein the forces act; because, when the force is given equal velocities are generated in equal times, and consequently the whole velocities acquired are as the times wherein the given force acts: wherefore, both times and accelerating forces being different, the velocities generated will be as the forces and times of action, jointly.

Cor. 1. The momenta generated in unequal bodies are also conjointly as the forces and their times of action. This is evident, because momenta in unequal bodies may be substituted for proportional velocities in equal bodies, throughout the whole reasoning.

Cor. 2. The momenta lost or destroyed in any times are likewise conjointly as the retarding forces and their times of action. For, whatever momenta any force generates in a given time would an equal force destroy in an equal time, by acting in a contrary direction.

And the same is true of the increase or decrease of motion, by forces that either conspire with, or oppose, the motions of bodies.

Cor. 3. The velocities generated or destroyed in any times are directly as the forces and times, and reciprocally as the bodies or masses. For, since the compound ratios of the bodies and their velocities are as those of the forces and times, the velocities are as the forces and times divided by the bodies.

Prop. In motions uniformly accelerated, when the force and body are given, the space described during a certain time is the half of that which the body, moving uniformly with the last acquired velocity, would describe in an equal time.

Since the velocities are as the times of description, when the body and force are given, the velocities which a given body is found to have successively for the duration of each consecutive interval form an arithmetical progression, g, $2g$, $3g$, &c. of which the last term is gt or v, the number of terms being t, that is to say, being marked by the number of solicitations of the accelerating force. And since each of the velocities is nothing else than the space which the body would describe uniformly during the corresponding interval, the total space described during the time t will therefore be the sum of the terms of this arithmetical progression; which, because g and v are the extremes and t the number of terms, will be expressed by $\frac{1}{2}t(g+v)$. Or if s be the total space described by the body, then will $s=\frac{1}{2}t(g+v)$. Conceive now that the accelerating force acts (as by hyp.) without intermission, or, which comes to the same, imagine that the time t is divided into an indefinite number of infinitely small parts, or instants, and that at the beginning of each instant the accelerating force gives an impulsion to the body. Then g being infinitely minute in relation to v, which is the velocity acquired during the indefinite number of instants denoted by t, must be omitted in the equation $s=\frac{1}{2}t(g+v)$, which will become simply $s=\frac{1}{2}tv$, the space actually described.

This granted, imagine that at the end of the time t the accelerating force ceases to act; then, by the first axiom, the body will persevere in its motion with the velocity v it has acquired: but in uniform motions the spaces described are as the times and velocities jointly, therefore the body moving with the velocity v, during the time t, will describe a space $s'=tv$; which is evidently double the space $\frac{1}{2}tu$ described by the body in an equal time, by the constant action of the accelerating force. Q. E. D.

Prop. The spaces described by a body uniformly accelerated are as the squares of the times.

Since the velocities acquired increase as the time expired, if ϕ be the velocity at the end of one second, then the velocity acquired after a number t of seconds will be ϕt; thus we have $v=\phi t$. The equation $s=\frac{1}{2}vt$, found in the preceding article, becomes therefore $s=\frac{1}{2}\phi t^2$. If, in like manner, we represent another space by S, which is described by uniform acceleration during the time T, we shall have $S=\frac{1}{2}\phi T^2$. Hence we see that $s : S :: \frac{1}{2}\phi t^2 : \frac{1}{2}\phi T^2 :: t^2 : T^2$. Q. E. D.

Cor. 1. Because the velocities acquired are as the times, we have also the spaces described as the squares of the velocities.

Cor. 2. Therefore either the velocities or the times are as the square roots of the spaces described from the commencement of the motion.

Cor. 3. All that has been shewn here applies equally to motions uniformly retarded; provided that by the times we mean those which are to elapse before the extinction of the velocity, and by the spaces those which remain to be described until the body is brought to rest. Similar propositions have, therefore, been applied to the motions of balls resisted by banks of earths, blocks of wood, &c. See Dr. Hutton's Select Exercises, and Atwood on Motion.

Cor. 4. The velocity ϕ which will be acquired at the end of a second is that which the accelerating force can generate in a second chosen as a unit of time; it is therefore a measure of the accelerating force, and may of course be safely substituted for that force in any of our subsequent investigations.

Scholium. We may now exhibit general theorems for resolving all problems relating to motions uniformly accelerated or retarded. In order to this, put B = any body or mass, F = the force acting constantly upon it, T = the time of its action, V = the velocity generated (or lost) in the time T, S = the whole space described, Q = the momentum or quantity of motion, at the end (or beginning) of the time: then the fundamental relations are $S \propto TV$, $Q \propto BV$, $Q \propto FT$, from which and the propositions and corollaries just laid down, we have—

$$B \propto \frac{Q}{V} \propto \frac{FT}{V} \propto \frac{QT}{S} \propto \frac{FT^2}{S} \propto \frac{FT^3}{QS} \propto \frac{Q^2}{FS} \propto \frac{Q^2}{FTV} \propto \frac{FS}{V^2}.$$

$$Q \propto BV \propto FT \propto \frac{BS}{T} \propto \frac{FS}{V} \propto \frac{FT^2V}{S} \propto \sqrt{BFS} \propto \sqrt{BFTV}.$$

$$F \propto \frac{Q}{T} \propto \frac{BV}{T} \propto \frac{QV}{S} \propto \frac{QS}{T^2V} \propto \frac{Q^2}{BTV} \propto \frac{BV^2}{S} \propto \frac{BS}{T^2}.$$

$$V \propto \frac{S}{T} \propto \frac{FT}{B} \propto \frac{Q}{B} \propto \frac{QS}{FT^2} \propto \frac{FS}{Q} \propto \frac{Q^2}{BFT} \propto \sqrt{\frac{FS}{B}} \propto \sqrt{\frac{F^2ST}{Q^2}}.$$

$$S \propto TV \propto \frac{FT^2}{B} \propto \frac{QT}{B} \propto \frac{FT^2V}{Q} \propto \frac{QV}{F} \propto \frac{Q^2}{BF} \propto \frac{Q^2V}{F^2T} \propto \frac{BV^2}{F}.$$

$$T \propto \frac{S}{V} \propto \frac{Q}{F} \propto \frac{BV}{F} \propto \frac{BS}{Q} \propto \sqrt{\frac{BS}{F}} \propto \sqrt{\frac{2S}{FV}} \propto \frac{Q^2}{BFV}.$$

When any quantities are given, or their relations to some fixed quantities of the same kind known, they are to be left out in the general theorems: thus, if the body be proportional to the force, we shall have $S \propto TV \propto F'T^2 \propto \frac{V^2}{F'}$, where $F' = \frac{F}{B}$.

As it is sometimes necessary to consider the effect of accelerating forces upon bodies already in motion, it will be worth while to deduce a general formula for that purpose. To this end let g represent, as above, the velocity due to the acceleration during each unit of time, gt will then be the total velocity acquired at the end of the time t: then, if we denote by v the velocity which the body has at the commencement of the time, and by V the velocity at the end of the time t, we have $V = v + gt$. But $V = \frac{\dot{s}}{\dot{t}}$, both in uniform and variable motions, the force or corresponding velocity being supposed constant for the indefinitely small time $\dot{t}$. Therefore $\frac{\dot{s}}{\dot{t}} = v + gt$, and taking the correct fluents, we have

$$\text{(IV.)} \quad S = s + vt + \tfrac{1}{2}gt^2.$$

Here the constant quantity s evidently represents the initial space, viz. the distance between the point of departure and that in relation to which we consider the several positions of the moving body: for $t = o$, gives $S = s$.

The general equation given in the last article may be readily constructed: for it is plain, from the theory of conic sections, that its locus is a common parabola. For, changing S into $x + a$, and t into $y + b$, we have

$$x + a = s + vy + vb + \tfrac{1}{2}g(y + b)^2.$$

Then determining the constant quantities a and b, by the equations

$$v + bg = o, \text{ and } a = s + vb + \tfrac{1}{2}gb^2.$$

We thence find $b = -\frac{v}{g}$, $a = s - \frac{v^2}{2g}$ and the equation (IV.) in the last article will become $y^2 = \frac{2}{g}x$, which is an equation of a parabola whose parameter is $\frac{2}{g}$.

Now the nature of the motion being supposed given, and the constant quantities s, v, g, being known, if AE (fig 6. Pl. 55.) is the line passed over by the moveable body, and we take $AB = s$, the initial space B will be the point of departure. Here it results from the preceding values of a and b, that if we make $CA = -\frac{v}{g}$, $CD = s - \frac{v^2}{2g}$, and then construct on DF as an axis a parabola DMmm, whose vertex is D, and parameter $\frac{2}{g}$, it will be the curve required; or that in which the ordinates AP, Ap, &c. will represent the times, and the corresponding abscissas PM, pm, &c. the spaces.

If we draw a tangent BR to the point B of the parabola, it will form with AT an angle RBN, of which the tangent will be $= v$. Moreover, if we set off from any point P in AT, the axis of the times, two consecutive seconds, or units of time, Pp, pp', and draw to the corresponding points M, m, of the locus, the tangents Mr, mr' we shall have $nr = v + gt$, $n'r' = v + g(t + 1)$, and consequently $n'r' - nr = g$. Or, we may find the length of g by another method: for, since $PM = s + vt + \tfrac{1}{2}gt^2$, and $pm = s + v(t + 1) + \tfrac{1}{2}g(t + 1)^2$, therefore $mn = v + gt + \tfrac{1}{2}g$; but $nr = v + gt$, whence $mr = \tfrac{1}{2}g$, and $2mr = g$.

Cor. When $s = o$, A coincides with B: and when $v = o$, B coincides with D, and RN vanishes.

III. *Variable Motions in general.*—When a moving body is subjected to the energy of a force which acts on it without interruption, but in a different manner at each instant, the motion is called in general, variable motion. We have instances of variable motions in the unbending of springs: although the velocity continues to be augmented, yet the degrees by which the augmentation proceeds are diminishing. It is the same with regard to the degrees by which the motion of a ship arrives at uniformity: the action of the wind on the sails diminishes in proportion as the vessel acquires greater velocity, because the action of the wind varies as the difference between its velocity and that of the sail on which it acts.

The different natures of constant and variable accelerating forces, and their corresponding motions, have been illustrated by Dr. Hutton in the following manner. "Let two weights, W, w, be connected by a thread passing over a pulley at A, B, or C (figs. 3, 4, 5, Pl. 55.); and let the weight W descend perpendicularly down, while it draws the smaller weight w up the line AD, or BE, or CF, the first being a straight inclined plane, and the other two curves, the one convex, and the other concave to the perpendicular. Then the small weight *w* will always make some certain resistance to the free descent of the large weight W, and that resistance will be constantly the same in every part of the plane AD, the difficulty to draw it up being the same in every point of it, because every part of it has the same inclination to the horizon, or to the perpendicular; and consequently the accession to the velocity of the descending weight W will be always equal in equal times; that is, in this case W descends by a uniformly accelerating force. But in the two curves BE, CF, the resistance or opposition of the small weight *w* will be constantly altering as it is drawn up the curves, because every part of them has a different inclination to the horizon, or to the perpendicular: in the former curve the direction becomes more and more upright, or nearer perpendicular, as the small weight *w* ascends, and the opposition it makes to the descent of W becomes more and more, and consequently the accession to the velocity of W will be always less and less in equal times; that is, W descends by a decreasing accelerating force; but in the latter curve CF, as *w* ascends, the direction of the curve becomes less and less upright, and the opposition it makes to the descent of W becomes always less and less; and consequently the accession to the velocity of W will be always more and more in equal times; that is, W descends by an increasing accelerating force. So that although the velocity continually increases in all these cases, yet whilst it increases in a constant ratio to the times of motion, in the plane AD; the velocity increases in a less ratio than the time it ascended by BE, and in a greater ratio than the time increases in the other curve CF."

The principles necessary for the determination of the circumstances of variable motions are easily deducible from what has been done with respect to uniform motions, and those which are uniformly accelerated or retarded; as will be seen in the next proposition.

Prop. To find the fundamental equations which apply to variable motions.

In whatever manner any motion is varied, if we consider it with relation to evanescent instants, we may conceive its velocity to be invariable during any such indefinitely minute interval. But when the motion is uniform the velocity is expressed by the quotient of the space s, described during the interval of time t, divided by that time: Therefore, when the velocity is only uniform for the evanescent instant $\dot{t}$, the velocity must be expressed by the indefinitely small space $\dot{s}$, described during this instant, divided by the instant itself. We have, therefore,

$$(\text{I.}) \ldots v=\frac{\dot{s}}{\dot{t}} \text{ or } \dot{s}=v\dot{t}.$$

"The equation $v=\varphi t$ which expresses the relation of the velocities to the times, in motions uniformly accelerated, gives $\varphi=\frac{v}{t}$; that is to say, when the accelerating force, or rather the quantity φ by which it is measured, is constant, it has for its expression the quotient of the velocity v, which it generates during a certain time t, divided by that time: therefore, if the accelerating force φ acts differently at each instant, we imagine it to be constant only for the evanescent instant $\dot{t}$, in which it would generate the velocity $\dot{v}$, and consequently,

$$(\text{II.}) \ldots \varphi=\frac{\dot{v}}{\dot{t}}, \text{ or } \dot{v}=\varphi\dot{t}.$$

In the equation $v=\varphi t$ we understand φ to denote the velocity that the accelerating force generates in the moving body during a determinate unit of time, as a second, by an action continued and always equal. In the equation $\dot{v}=\varphi\dot{t}$ we ought to understand the same thing. But it is necessary to observe, that the accelerating force being supposed variable, the quantity φ, which represents the velocity which it would be capable of generating if it acted as a constant accelerating force during a second, is different for every instant of its motion. Thus we easily conceive that when the accelerating force becomes smaller, the velocity which it will be capable of generating in a second, by its action repeated uniformly during each instant of this second, must be smaller, and *vicè versâ*.

The two preceding equations readily furnish a third, which may often be advantageously adapted; for, from the equation $\dot{s}=v\dot{t}$, we deduce $\dot{t}=\frac{\dot{s}}{v}$: substituting this value of $\dot{t}$ in the equation $\dot{v}=\varphi\dot{t}$, we readily find

$$(\text{III.}) \ldots \varphi\dot{s}=v\dot{v}, \text{ or } \varphi=\frac{v\dot{v}}{\dot{s}}.$$

Again, employing the same equations, since $\dot{v}=\varphi\dot{t}$, and $v\dot{t}=\dot{s}$, we have by multiplication $v\dot{t}\dot{v}=\varphi\dot{t}\dot{s}$; whence, striking out $\dot{t}$, there remains $v\dot{v}=\varphi\dot{s}$. But $v\dot{v}=\frac{1}{2}(vv)^{\cdot}$, consequently,

$$(\text{IV.}) \quad \varphi\dot{s}=\tfrac{1}{2}(vv)^{\cdot}.$$

In the reasoning by which we found the equations $\dot{v}=\varphi\dot{t}$, we have considered the velocity as increasing. If, therefore, cases arise in which the velocity diminishes, its fluxion will become negative, and the equations $\dot{v}=\varphi\dot{t}$, and $\varphi\dot{s}=v\dot{v}$, in order to accommodate them to all cases which may arise, must be written with the double sign: viz. $\pm\dot{v}=\varphi\dot{t}$, and $\varphi\dot{s}=\pm v\dot{v}$. the superior sign obtaining when the motion is accelerated, and the lower one when it is retarded.

The equation $\dot{s}=v\dot{t}$, or $v=\frac{\dot{s}}{\dot{t}}$, being fluxed, gives $\dot{v}=\left(\frac{\dot{s}}{\dot{t}}\right)^{\cdot}$: if this value be substituted for $\dot{v}$ in the equation $\varphi\dot{t}=\pm\dot{v}$, it will become

$$(\text{V.}) \ldots \varphi\dot{t}=\pm\left(\frac{\dot{s}}{\dot{t}}\right)^{\cdot}.$$

And this equation must be employed when $\dot{t}$ is supposed variable: but if we imagine, as it is often right to do, that $\dot{t}$ is constant, we have $\varphi\dot{t}=\pm\frac{\ddot{s}}{\dot{t}}$; wherefore

$$(\text{VI.}) \ldots \varphi\dot{t}^2=\pm\ddot{s}, \text{ or } \varphi=\frac{\ddot{s}}{\dot{t}^2}.$$

Scholium. According to whatever law the motions of bodies may be varied, we may construct curves as loci of the equations which comprise the relations of the times and spaces: but since there will be as many kinds of curves as there may arise equations comprising the law of the variations, it will be impossible to attend to them minutely here. All, therefore, that will be remarked in this place is, that when the motion is accelerated, the corresponding curve will present its convexity to the axis of the time; while, if the motion is retarded, the concavity of the curve will be presented to that axis: and if in any instant whatever the motion becomes uniform, the curve will then degenerate into a right line, which will be a tangent to that point of the curve which corresponds with the instant of time in which the uniformity of the motion commences.

Having now deduced the chief formulæ in variable motions, it remains for us to present an example or two of their use and application.

I. Suppose that a material point, or very small globe, placed at A (fig. 7. Pl. 55.) is solicited by two forces; the one tending to make it move from A towards B, with a motion uniformly varied; the other tending, on the contrary, to push it back from A towards D: the circumstances of the motion of the globule are required, on the supposition that the repulsive power impresses upon it an accelerating force varying inversely as the distance from the point B. Let $AB=a$, $AN=s=$ the space passed over at the end of the time t; the accelerating force which arises from the repulsion from A towards D will be $=\frac{m}{a+s}$, m being a constant quantity depending upon the law according to which the repulsive force acts. Lastly, let $g=$ the constant accelerating force which arises from the impulsion of the moving point from A towards D. The force accelerating the motion which we consider as being the difference of these two forces, we have by the equation (VI.) which gives

$$\frac{\ddot{s}}{\dot{t}^2}=\frac{m}{a+s}-g.$$

To find the fluent of this equation, we must multiply by $\dot{s}$, whence will arise $\frac{\dot{s}}{\dot{t}}\times\left(\frac{\dot{s}}{\dot{t}}\right)^{\cdot}=v\dot{v}=\frac{m\dot{s}}{a+s}-g\dot{s}$; and consequently, by a well-known form, $\frac{1}{2}v^2=m\mathrm{H{\cdot}L{\cdot}}(a+s)-gs+\mathrm{C}$. Where, since at the point A we have $v=0$, and $s=0$, we conclude that $\mathrm{C}=-m\mathrm{H{\cdot}L{\cdot}}a$. Therefore,

$$v=\pm\sqrt{(2m\mathrm{H{\cdot}L{\cdot}}\frac{a+s}{a}-2gs)}.$$

This equation determines the velocity that the moving body has when it has run over the space s: here if we put for v its value $\frac{\dot{s}}{\dot{t}}$ and find the corresponding fluent, we shall obtain the time t in terms of the space: but this is sometimes attended with considerable difficulty.

The problem just resolved finds its application in a case which we shall now state: if a heavy body, as a piston, is forced into a cylinder or vertical tube BD, open only at the extremity D, which the piston closely fits, and if the part AB is full of a compressed elastic fluid, or of an expansive vapour; then, not considering the friction of the piston against the sides of the tube, it is obvious that this piston will be subjected to the action of gravity which tends to make it descend, and impresses a constant and accelerating force g, and at the same time to the repulsive force of the elastic fluid: but this fluid having less spring as it is less compressed, viz. as the piston is further distant from the extremity B, the accelerating force thence arising varies inversely as the distance of the moveable piston from the bottom of the tube.

We have an example of this species of motion in the balls of guns, and pieces of cannon, driven by the inflammation of the powder: this produces instantaneously a great quantity of an aeriform fluid, of which the repulsive force is inversely as the space in which it is contained. We here neglect the consideration of the weight of the ball, since it has but little effect upon the velocity up to the mouth of the piece, the weight being nothing in theory when the axis of the piece is horizontal. We therefore make $g=0$, or, which amounts to the same, we consider at the commencement of the calculation the accelerating force as $=\frac{m}{a+s}$: consequently,

$$v=\sqrt{2m\mathrm{H{\cdot}L{\cdot}}\frac{a+s}{a}}.$$

Making s to equal the distance of the point A from the orifice, this equation gives us the velocity with which the ball issues from the piece.

If the weight of the powder, and of the ball, be taken into the computation, it will of course become more intricate: the general principle, however, is still the same. These particulars, with other minutiæ affecting the investigation, are considered by Dr. Hutton, in a solution which may be seen in his Select Exercises.

II. Let there be at D (fig. 7.) a material point, or globule, solicited by an accelerating force varying inversely as the square of the distance of the moveable from the point B; it is required to find the equation of its motion.

Put $BD=a$, $DN=s=$ the space passed over at the end of the time t: when the globule has arrived at N, its distance from B will be $a-s$, and the accelerating force is $\frac{m}{(a-s)^2}$, m being again a constant quantity which depends upon the nature of this force; viz. its magnitude at a unit of distance from the centre of attraction. Here, then, we have from the equation vi.

$$\frac{\ddot{s}}{\dot{t}^2}=\frac{m}{(a-s)^2}$$

Multiplying, as before, by $\dot{s}$ we obtain $\frac{\dot{s}}{\dot{t}}\times\left(\frac{\dot{s}}{\dot{t}}\right)^{\cdot}=v\dot{v}=\frac{m\dot{s}}{(a-s)^2}$; whence $v^2=\frac{2m}{a-s}+\mathrm{C}$. Supposing that at the origin D the globule were not animated with any velocity, we should have at the same time $s=0$, and $v=0$; therefore $\mathrm{C}=-\frac{2m}{a}$. Substituting this, and reducing, we have

$$v=\sqrt{\frac{2m}{a}}\times\sqrt{\frac{s}{a-s}}.$$

Now, to obtain from this equation of the relations between v and s that which obtains between s and t, we must substitute $\frac{\dot{s}}{\dot{t}}$ for v: then taking the reciprocal of the expression, multiplying by $\dot{s}$, and the quantity affected with the radical by

$a-s$, we have $\dot{t}=\sqrt{\frac{a}{2m}}\times\frac{a-s}{\sqrt{as-s^2}}\dot{s}$, where the last factor is equivalent to $\frac{\frac{1}{2}a-s}{\sqrt{as-s^2}}\dot{s}+\frac{1}{2}a\times\frac{\dot{s}}{\sqrt{as-s^2}}$. The first term has for its fluent $\sqrt{as-s^2}$: that of the second is found by transforming s into $\frac{1}{2}a-z$; it is then $\frac{1}{2}a\times$ arc $\left(\cos.=\frac{2z}{a}\right)$: consequently $t=\sqrt{\frac{a}{2m}}\times\left\{\sqrt{as-s^2}+\frac{1}{2}a.\ \text{arc}\left(\cos.=\frac{a-2s}{a}\right)\right\}$ This requires no correction, because s ought to be nothing at the same time that t is.

The preceding values of v and t resolve the problem proposed in the most general manner, comprising all the particular circumstances of the motion: we remark, for example, that $s=a$, gives $v\ \infty$, and $t=\sqrt{\frac{a}{2m}}\times\frac{1}{2}a\pi$, where π is the circumference of the circle whose diameter is unity: the first of these expressions indicates that the velocity of the moving point is infinite at the centre of attraction; which is natural to conceive, because the force is so much the more intense as the moveable is nearer the centre, the second expression is proportional to $a\sqrt{a}$, or $a^{\frac{3}{2}}$; whence it follows, that the times employed by two bodies in descending from repose to the centre of attraction are respectively as the square roots of the cubes of the heights fallen from.

In the case where bodies fall by their own gravity towards the earth, the attracting body being considered as a point with regard to the distance s, we shall have $m=32\frac{1}{6}$ and $t=795398\ a\sqrt{\frac{2a}{m}}$.

III. It is required to determine the circumstances of velocity, time, and space, with relation to a body, which moves from quiescence in consequence of an attracting force which varies directly as the distance from the centre of force.

Let the point from which the body commences its motion be P (fig. 8.) and let PC $=a$, its distance from C the centre of force; let $v=$ the velocity at any variable distance AC $=s$, and at any distance d from c let f be the force compared with that unit of force whose representative is m. Then, by the nature of the problem, it will be $d:s::f:\frac{fs}{d}$, the force at the distance s, compared with unity, or $\frac{mfs}{d}$ will be that force with respect to the measure m, corresponding with ϕ in our equation iii. Hence, since v increases as s decreases, we shall have

$$v\dot{v}=-\frac{mfs}{d}\dot{s}.$$

This equation gives us $v^2=-\frac{mf}{d}s^2+C$. Here when $v=0$, $s=a$, and $0=-\frac{mf}{d}a^2+C$; therefore $C=\frac{mf}{d}a^2$; and consequently $v^2=\frac{mf}{d}\times(a^2-s^2)$, and $v=\sqrt{\frac{mf}{d}}\times\sqrt{a^2-s^2}$. Hence then, if with centre C and radius CP, the quadrant PDB be described, and at the point A, whose distance from C is $=s$, the ordinate AD be drawn, because $AD=\sqrt{CD^2-CA^2}=\sqrt{a^2-s^2}$, we shall have $v=AD\sqrt{\frac{mf}{d}}$.

In order to find t, we must adopt the equation (1) or $\dot{t}v=-\dot{s}$, whence arises $\dot{t}=-\frac{\dot{s}}{v}=\sqrt{\frac{d}{mf}}\times\frac{-\dot{s}}{\sqrt{a^2-s^2}}$. Now, if $z=$ arc PD, we have $\dot{z}:-\dot{s}::a:\sqrt{a^2-s^2}$; therefore $\frac{-\dot{s}}{\sqrt{a^2-s^2}}=\frac{\dot{z}}{a}$, and consequently $\dot{t}=\frac{\dot{z}}{a}\sqrt{\frac{d}{mf}}$: the fluent of this expression is $t=\frac{z}{a}\sqrt{\frac{d}{mf}}=\frac{PD}{CP}\sqrt{\frac{d}{mf}}$; which wants no correction, because when $t=0$, $z=0$. So that while the velocity of any point A is as the corresponding sine AD, the time of descent to that point is as the arc PD. When A arrives at C we have $t=\frac{PDB}{PC}\sqrt{\frac{d}{mf}}=\frac{1}{2}\pi\sqrt{\frac{d}{mf}}$, for the time of falling to the centre. Hence, from whatever altitude CP the body begins to fall towards the centre, its whole time of descent will be the same, $\frac{PDB}{PC}$ being in all cases $=\frac{1}{2}\pi=1{\cdot}570796$, a constant quantity.

Cor. If a body be acted upon by a force which is every where as the distance from C, the time of its descent to that centre from any point P is to the time in which it would descend through that same space, if impelled by half the first force uniformly continued, as the circumference of a circle to four diameters. For, on the first supposition the time is as the quadrantal arc PB; and on the latter the time is as 2PC; and PB : 2PC : : circumf. : 8PC or 4 diameters.

On the supposition that the earth were a homogeneous sphere, the force of attraction to which any body below its surface would be subjected varies as the distance from the centre: if, therefore, a perforation were made in a right line from the surface to the centre, the circumstances of a body falling from the surface will be determined from the preceding investigation. In this case d, the distance at which the effects of the force are known, would be $=20935200$ feet, and f the effect of gravity compared with unity, or mf, compared with the assumed measure m, would be represented by $32\frac{1}{6}$ feet, the velocity acquired by a falling body after one second. Hence, when the body has fallen to C, we shall have $v=CB\sqrt{\frac{mf}{d}}=d\sqrt{\frac{mf}{d}}=\sqrt{mfd}=25950$ feet, or 4·9148 miles per second, for its velocity there: and $t=1{\cdot}570796\sqrt{\frac{d}{mf}}=1267\frac{4}{5}''=21'\,7\frac{4}{5}''$, for the time of falling to the centre.

We close the subject of variable motions with observing that if the velocity v be as any power n of s the space described, the time may be found by the method of fluxions: for, since v is as s^n, and $\dot t$ as $\frac{\dot s}{v}$, it will also be as $\frac{\dot s}{s^n}$, consequently $t = \frac{s^{1-n}}{1-n} + C$, the correction. The application of this theorem to any cases which the student wishes to pursue must be left to his own industry.

IV. *Principle of M. D'Alembert.*—We shall here explain briefly the nature and application of a very fertile principle, first presented to the world by M. D'Alembert in his Dynamique. The general proposition is this:

Prop. In whatever manner several bodies change their actual motions, if we conceive that the motion which each body would have in the succeeding instant, if it were quite free, is decomposed into two others, of which one is the motion which it really takes in consequence of their mutual actions, the second must be such, that if each body were impelled by this force alone (that is, by the force which would produce this second motion,) all the bodies would remain in equilibrio.

This is evident: for if these second constituent forces are not such as would put the system in equilibrio, the other constituent motions could not be those which the bodies really take in consequence of their mutual action, but would be changed by the first.

The use of this proposition will appear from the following examples.

I. Let there be three bodies B, B′, B″, and let the forces F, F′, F″, act upon them, so as to give them the velocities v, v', v'', in any directions whatever, producing the quantities of motion. Bv, $B'v'$, $B''v''$, which we may call F, F′, F″, because the momenta are the proper measures of the moving forces. Let us further suppose that by striking each other, or being any way connected with each other, they cannot take these motions F, F′, F″, but really take the motions f, f' f''. It is obvious that we may consider the motion F impressed upon the body B to be composed of the motion f which it really takes, and of another motion φ. In like manner F′ may be resolved into f' which it actually takes, and another φ'; and again F″ into f'' and φ''. The motions will be the same whether B be acted upon with the force F, or the constituent forces f and φ; whether B′ be acted upon by F′, or by f' and φ'; and B″ by the force F″, or the component forces f'' and φ''. Now, by the supposition, the bodies actually take the motions f, f', f'': therefore the motions φ, φ', φ'', must be such as will not derange the motions f, f', f'': that is to say, if the bodies had only the motions φ, φ', φ'', impressed upon them they would destroy each other, and the system would remain at rest.

II. *Motions upon double inclined planes.*—Let AC, CB (fig. 9. Pl. 55.), represent two inclined planes of equal altitudes, set back to back at DC, the angles of elevation being DAC $= e$, and DBC $= e'$; and let the two weights W, W′, united by a thread WCW′ passing over the pulley C, act the one upon the other. Then, calling w, w', their masses, or their weights, let us determine the circumstances of their motion.

At the end of the time t, w will have a velocity v, and gravity would impress upon it in the instant $\dot t$ following a new velocity $= g . \sin. e . \dot t$ provided the weight w were then entirely free: but, by the disposition of the system, $\dot v$ will be the velocity which obtains in reality. Then estimating the spaces in the direction CW, as the body W′ moves with an equal velocity but in a contrary sense, it is obvious that the decomposition may be made as follows. At the end of the time $t + \dot t$ we have for the velocity impressed upon

$$\text{W} \ldots\ldots v + g . \sin. e . \dot t \ \text{where} \left\{\begin{array}{l} v + \dot v' \ldots \text{ effective velocity from C towards A.} \\ g . \sin. e . \dot t - \dot v \text{ velocity destroyed.} \end{array}\right.$$

$$\text{W} \ldots\ldots -v + g . \sin. e' . \dot t, \ \text{where} \left\{\begin{array}{l} -v - \dot v \ldots\ldots \text{ effective velocity from C towards B.} \\ \dot v + g . \sin. e . \dot t \ldots \text{ velocity destroyed.} \end{array}\right.$$

If, therefore, gravity impresses, during the time $\dot t$, upon the masses w, w', the respective velocities $g . \sin. e . \dot t - \dot v$, and $g . \sin. e' . \dot t + \dot v$, the system will be in equilibrio. The quantities of motion being therefore equal, we have

$$w . g . \sin. e . \dot t - w\dot v = w' . g . \sin. e' . \dot t + w'\dot v.$$

Whence we deduce for the effective accelerating force

$$(\text{I.}) \ldots \varphi = \frac{\dot v}{\dot t} = \frac{w \sin. e - w' \sin. e'}{w + w'} \times g.$$

Thus it appears that the motion is uniformly varied: and we readily find

$$(\text{II.}) \ldots v = \frac{w \sin. e - w' \sin. e'}{w + w'} g . t.$$

$$(\text{III.}) \ldots s = \frac{w \sin. e - w' \sin. e'}{w + w'} . \tfrac{1}{2} g t^2.$$

Such are the equations from which the conditions of the motion are determined. If the two planes are vertical, then is $e = e' = \frac{1}{2}\pi$; by means of which we may find the values that are applicable in the subsequent example.

III. *Motion on the fixed pulley.*—The weights P and W are united by a thread running over the pulley; the force of gravity g which solicits them cannot produce its entire effect, because its action upon the body P $= w$ counteracts its effect upon the other body W $= w'$. At the end of the time $t + \dot t$, the velocity of w, in the direction from A to P, will be $v + \dot v$, instead of $v + g\dot t$, which it would have had if the weight had become free at the end of the time t: thus $g\dot t - \dot v$ will be the velocity destroyed. In like manner, w' having the same velocity, but in a contrary direction, will have the velocity $-(v + \dot v)$ instead of $-(v + g\dot t)$, which it would have had, if at the end of the time t the connection of the two bodies ceased; so that $g\dot t + \dot v$ will be the velocity destroyed. Then, as in the preceding example, making the momenta equal, we find for the effective accelerating force

$$(1.) \ldots \varphi = \frac{\dot v}{\dot t} = \frac{w - w'}{w + w'} \times g.$$

This being an expression for a constant accelerating force, we conclude, as in the former instance, that the motion is uniformly varied, and that the circumstances of motion and of velocity may be found by the equations

$$(2.)\ldots v=\frac{w-w'}{w+w'}gt.$$

$$(3)\ldots s=\frac{w-w'}{2w+2w'}gt^2.$$

In this investigation we have neglected the inertia of the string and the pulley.

In finding the equations (2.) (3.) above, we supposed that each body began to move from quiescence at a point taken for the origin of the spaces denoted by s. But suppose this is not the case, and that we impress upon w an initial velocity of V carrying it downward. This velocity must be parted between the two masses w, w', according to the same law as if w struck the body w' at rest with the velocity V: thus, the velocity common to the two weights would be $\frac{wV}{w+w'}$. We have this value for the velocity at the end of the time $t=0$; therefore

$$(4.)\ldots v=\frac{wV+(w-w')gt}{w+w'},$$

From this we readily obtain s in terms of t: and the time may be determined by the equation $wV=(w-w')gt$.

IV. *Motion on the Axis in Peritrochio.*—Let the weight P (fig. 10.) be denoted by w, and the weight W by w'; to determine the circumstances of the motion. Let the radius of the wheel $=$R, that of the axle $=r$: the velocity of w at the end of the time t will be $v+\dot{v}$, instead of $v+g\dot{t}$, as in the former cases; that of w' will manifestly be to that of w in the ratio of R to r; it will, therefore, be $-\frac{r}{R}(v+\dot{v})$ instead of being $-\frac{r}{R}(v+g\dot{t})$: the velocities lost are therefore $g\dot{t}-\dot{v}$ and $g\dot{t}-\frac{r}{R}v$. Then making the momenta equal with respect to the axe EF, we find

$$(i.)\ldots \varphi=\frac{\dot{v}}{\dot{t}}=\frac{R^2w-Rrw'}{R^2w+r^2w'}\times g.$$

Consequently, the motion is uniformly accelerated in this case likewise. So that we readily deduce the equations for the motion of w or P.

$$(ii.)\ldots v=\frac{R^2w-Rrw'}{R^2w+r^2w'}gt.$$

$$(iii.)\ldots s=\frac{R^2w-Rrw'}{R^2w+r^2w'}\cdot\tfrac{1}{2}gt^2.$$

And the velocity and space, with respect to w', will be

$$(iv.)\ldots V=\frac{Rrw-r^2w'}{R^2w+r^2w'}gt.$$

$$(v.)\ldots S=\frac{Rrw-r^2w'}{R^2w+r^2w'}\cdot\tfrac{1}{2}gt^2.$$

Thus much is here offered on the application of M. D'Alembert's principle: the further use of it may appear in some subsequent articles of this work.

V. *Motion of a system of bodies.*—This branch of our subject, embraced in all its generality, would of itself fill volumes: we must content ourselves with presenting here a cursory sketch of the spirit of the principal methods, without entering into the minutiæ of the calculus.

When a body receives an impulsion according to a direction which passes through its centre of gravity, all its parts move with an equal velocity. If such direction pass beside that point, the several parts of the body have unequal velocities, and from that inequality of velocities there results a rotatory motion of the body about its centre of gravity, at the same time that this centre is transported with the velocity which it would have taken if the direction of the impulsion had passed through such point. This case is analogous to that of the earth and other planets. Thus, to explain the double motion of rotation and of translation of the earth, it suffices to suppose that it received primitively an impulsion, the direction of distance from its centre of gravity, a distance indeed, which, on the hypothesis of the homogeneity of our planet, is nearly the hundred and sixtieth part of its radius.

An impulsion given to a homogeneous sphere according to a direction which passes not through its centre, causes it to turn constantly about the diameter perpendicular to the plane drawn through its centre and through the direction of the force impressed. New forces which solicit all its points, and of which the resultant passes through its centre, alters not the parallelism of its axis of rotation. It is thus that the axis of the earth always continues very nearly parallel to itself in its revolution about the sun.

If a body have any figure whatever, its axis of rotation may vary at every instant. The enquiry into these variations, whatever the forces may be which act upon the bodies, is the most interesting problem in the mechanics of hard bodies by reason of its connection with the precession of the equinoxes and the libration of the moon. In the solution of it, mathematicians have been led to this curious and useful result, namely, that in every body there exists three axes respectively perpendicular, about which it may turn uniformly, when it is not solicited by extraneous forces; these have, therefore, been named principal axes of rotation.

A body, or a system of heavy bodies, of whatever figure, oscillating about a fixed horizontal axis, forms a compound pendulum. In nature there exists no other, and the simple pendulums commonly spoken of are no other than pure geometrical conceptions, proper to simplify the objects. It is easy to refer to them compound pendulums whereof all the points are firmly and invariably connected. If we multiply the length of the simple pendulum, whose oscillations are of the same duration as those of the compound pendulum, by the entire mass of this latter pendulum, and by the distance of its centre of gravity from the axis of oscillation; the product will be equal to the sum of the products of each molecule of the compound pendulum, by the square of its rerespective distance from the same axis. It is by means of this rule, found by Huyghens, that the experiments on compound pendulums have ascertained the length of the simple pendulum which beats seconds. See PENDULUM.

Imagine a pendulum making very small oscillations in the same plane, and suppose that at the moment when it is most distant from the vertical, a small force is impressed upon it perpendicular to the plane of its motion, it will describe an ellipse about the vertical line. To represent its motion we may conceive a fictitious pendulum which continues to oscillate as the real pendulum would have done had not the new force been impressed upon it, while this latter pendulum oscillates on each side of the ideal pendulum, as if this pendulum were immoveable and vertical. Thus, the motion of the real pendulum is the result of two oscillations which exist together, and which it is easy to determine.

This method of considering the minute oscillations of bodies may be extended to any system whatever. If we suppose the system deranged by small impulsions from its state of equilibrium, and that afterwards it receives new impulsions; it will oscillate with respect to the successive states which it would have taken in virtue of the first impulsions, in the same manner as it would oscillate with regard to its state of equilibrium if the new impulses had been impressed upon it solely in that state. The very minute oscillations of a system of bodies, however compound they are, may therefore be considered as being formed of simple oscillations perfectly similar to those of the pendulum. In effect, if we conceive the system very little deranged from its state of equilibrium, in such manner that the force which solicits each body tends to reduce it to the point which it would occupy in that state, and moreover is proportional to its distance from that point; it is clear that this will obtain during the oscillation of the system, and that at every instant the velocities of the different bodies will be proportional to their distances from the position of equilibrium: they will, therefore, all arrive at the same instant at that position, and will oscillate in the same manner as a single pendulum. But the state which we have attributed to the system is not single. If we remove one of these bodies from its position of equilibrium, and enquire the position of the other bodies, to accord with the preceding conditions, we shall arrive at an equation of a degree equal to the number of bodies in the system, moveable respectively; which will give so many simple oscillations as there are in number of such bodies. Conceive the system to have the first of these oscillations; and at any instant whatever, remove mentally all the bodies from their position proportionally to the quantities that relate to the second simple oscillation. By virtue of the coexistence of the oscillations the system will oscillate with regard to the successive states it would have occupied by the first simple oscillation, as it would have oscillated by the second alone, about its state of equilibrium: its motion, therefore, will be constituted by the two first simple oscillations. We may, in like manner, combine with this motion, the third simple oscillation; and by continuing thus to combine all these oscillations in the most general manner, we shall represent all the possible motions of the system.

Hence results an easy mean of ascertaining the absolute stability of its equilibrium. If in all the positions relative to each simple oscillation, the forces that solicit the bodies tend to reduce them to the state of equilibrium, that state will be stable; on the contrary, we shall have a relative stability, if in some of those positions the forces tend to remove the body from that state.

It is manifest that this mode of contemplating the very minute motions of a system may be extended even to fluids, the oscillations of which are the results of simple oscillations existing simultaneously, and frequently of an infinite number of them.

We have a sensible example of the coexistence of minute oscillations in waves. When we agitate slightly a point of the surface of quiescent water, we see circular waves forming and extending around that point. Agitating the surface in another point, new waves are formed and intermingle with the former: yet they are superposed to the surface agitated by the former waves, as they would have been disposed over that surface had it been tranquil, in such manner that we can distinguish them perfectly in their intermixture. What the eye perceives relatively to waves, the ear traces with respect to sounds or to undulations of the air, which are propagated simultaneously without affecting each other, and thus make very distinct impressions.

This principle of the coexistence of simple oscillations, for which we are indebted to Daniel Bernoulli, is one of those general results which interest by the facility which they give to the imagination of representing phenomena and their successive changes. We may easily deduce from it the analytic theory of the minute oscillations of a system. They depend on linear differential equations, the complete integrals of which are the sum of the particular integrals. Thus, the simple oscillations, superposed some over others to form the motion of a system, are like the particular integrals which they represent and which are combined together to form the complete integral. It is pleasing to follow thus in the phenomena of nature, the intellectual verities of analysis. This correspondence, of which the system of the world furnishes numerous examples, constitutes one of the greatest charms attached to mathematical speculations.

The method of referring the laws of motion to those of equilibrium by the principle of D'Alembert, already explained, is very luminous and general. It remained, however, to combine with this principle that of the virtual velocities, to give to mechanics all the perfection of which it appeared susceptible. Lagrange has accomplished this, and has thereby reduced the determination of the motion of any system of bodies, to the integration of differential equations. The most simple manner of forming these equations is in brief this:

If we imagine three fixed axes respectively perpendicular, and at any instant whatever we decompose the velocity of each material point of a system of bodies, into three others parallel to those axes, we may consider each partial velocity as being uniform for that instant; we may next conceive at the end of the instant, the point animated, in a direction parallel to one of those axes, by three velocities, namely, by its velocity in that instant, by the little variation which it would receive in the succeeding instant, and by that same variation applied in a contrary direction. The two first of these velocities exist in the subsequent instant; the third must therefore be destroyed by the forces that solicit the point, and by the action of the other points of the system. Thus, by conceiving the instantaneous variations of the partial velocities of each point of the system, applied to such point, in a contrary direction; the system must be in equilibrio in virtue of all those variations and of the animating forces. The principle of virtual velocities furnishes the equations of that equilibrium; and by combining them with those which represent the connection of the parts of the system, we shall have the differential equations of the motion of each of those points.

The consideration of the differential equations of the motion of a system of bodies has led to the discovery of several very useful general principles of mechanics, and which are indeed an extension of those previously developed relative to the motion of a point.

A material point moves uniformly in a right line, if it do not experience the operation of extraneous causes. In a system of bodies which act upon one another, without experiencing the action of exterior causes, the common centre of gravity moves uniformly in a right line, and its motion is the same as if, all the bodies being supposed concentred at that point, all the forces which animate them were immediately applied there; so that the direction and the quantity of their resultant remain constantly the same.

The radius vector of a body solicited by a force directed towards a fixed point describes areas proportional to the times. (See CENTRAL FORCES.) If we suppose a system of bodies acting upon each other in any manner whatever, and solicited by a force directed towards a fixed point; if from this point we draw to all of them radii vectores, which we project upon an invariable plane passing through that point, the sum of the products of the mass of each body, by the area traced by the projection of its radius vector, is proportional to the time. In this consists the principle of the conservation of areas.

If there be no fixed point towards which the system is attracted; and the system is subject to no other than the mutual action of its parts; we may then assume any point we please for the origin of the radii vectores.

The product of the mass of a body by the area described by the projection of its radius vector, during a unit of time, is equal to a projection of the entire force of that body multiplied by the perpendicular demitted from the fixed point upon the direction of the force thus projected: this latter product is the moment of the force to cause the system to turn about that axis of the system, which, passing through the fixed point, is perpendicular to the plane of projection: the principle of the conservation of areas, therefore, is reduceable to this, that the sum of the moments of the finite forces to produce a rotation of the system about any axis whatever, (a sum which in the state of equilibrium is nothing) is constant in the state of motion. Presented in this shape, the principle applies to all possible laws between the force and the velocity.

The product of the mass of a body by the square of its velocity, is by most continental philosophers called *living force.* When a body moves over a curve or a surface without experiencing any foreign action, its living force is always the same, since its velocity is constant: if the bodies of a system experience no other actions than their mutual tractions and pressures, either immediately or through the intervention of bars and inextensible cords without elasticity, the living force of the system is constant, even in the case where several of these bodies are constrained to move over curve lines or surfaces. This is the principle of the conservation of living forces (*vires vivæ*); a principle which extends to all possible laws between the force and the velocity, if we designate by living force of a body, double the integral of the product of its velocity, by the differential of the finite force with which it is animated.

In the motion of a point solicited by any forces whatever, the variation of the living force is equal to twice the sum of the products of the mass of the point, by each of the accelerative forces, multiplied respectively by the elementary quantities whereby the point is advanced towards their origins. In the motion of any system whatever, the double of the sum of all these products is the variation of the living force of the system.

Conceive that in the motion of a system, all the bodies were at the same instant in the position where they would be in equilibrium by virtue of the various accelerating forces; the variation of the living force will there be nothing, by the principle of virtual velocities; the living force, therefore, will then be at its maximum or at its minimum. If the system were moved only by one of its simple oscillations, the bodies on quitting the situation of equilibrium would tend to return thither, if the equilibrium be stable; the velocity would therefore diminish in proportion as they receded farther, and of consequence, the living force would be a maximum in that position; but it would be a minimum if the equilibrium were not stable, the bodies on being removed from the position relative to that state having a tendency to recede farther. Hence we may conclude that if the living force is constantly a maximum when the bodies arrive at the same instant at the position of equilibrium, whatever may be their velocity, the equilibrium is stable; and that, on the contrary, there is neither absolute nor relative stability, if the living force in that position of the system is constantly a minimum.

Lastly, it may be remarked that the sum of the integrals of the product of each finite force of the system, by the element of its direction (a sum which in the state of equilibrium is nothing), is a minimum in the state of motion. This constitutes the principle of the least action, a principle which differs from those of the uniform motion of the centre of gravity, of the conservation of areas and of living forces, in this, that those principles are true integrals of the differential equations of the motion of bodies; while in that of the least action, it is only a singular combination of the same equations.

We must here make a remark respecting the extension of these several principles: that of the uniform motion of the centre of gravity, and the principle of the conservation of areas, subsist even in the case where, by the mutual action of the bodies, they experience sudden changes in their motions, which renders these principles of essential service in numerous circumstances: but the principle of the *Conservatio virium vivarum,* and that of the least action, require that the variations in the motions of the system shall be made imperceptibly.

If the system experience rapid changes, by the mutual action of the bodies, or by meeting with obstacles; the living force receives at each of these changes a diminution equal to the sum of the products of each body by the square of its velocity destroyed, by conceiving its velocity previous to the change, decomposed into two, the one which subsists, the other which is annihilated, and of which the square is evidently equal to the sum of the squares of the variations which the change causes to be experienced by the velocity when decomposed into directions parallel to any three axes whatever respectively perpendicular to each other.

All these principles would still subsist with regard to the relative motion of the bodies of a system, if they were subjected to a general motion, and at the same time common to the foci of the forces which we suppose fixed. They have place likewise, in the relative motion of bodies on the earth.

Whatever be the motion of the system and the variations it undergoes through the mutual action of its parts; the sum of the products of each body, by the area traced by its projection about the common centre of gravity, on a plane which, passing through that point, continues always parallel to itself, is constant. The plane on which this sum is a maximum retains a parallel situation during the motion of the system: the same sum is nothing with respect to every plane which, passing through the centre of gravity, is perpendicular to that of which we have been speaking; and the squares of the three similar sums relative to any three planes drawn through the centre of gravity and respectively perpendicular, are equal to the square of the maximum sum. The plane corresponding to this sum possesses farther this remarkable property, namely, that the sum of the projections of the areas traced by bodies one about another, and multiplied respectively by the product of the masses of the two bodies which are united by each radius vector, is a maximum on that plane and on all those which are parallel to it. We may therefore hence ascertain, at every instant, a plane which, passing through any one of the points of the system, retains always a parallel situation; and, since by referring thither the motion of the bodies, two of the arbitrary constant quantities of that motion will disappear, and thus simplify the calculus, it is natural to choose this plane for that of the co-ordinates, and to fix the origin at the centre of gravity of the system.

For more on this subject connected with Dynamics, see the articles FORCE, PROJECTILES, ROTATION, &c. And the reader who wishes to investigate the subject profoundly should peruse the Mecanique Philosophique of Prony, the Mecanique Analytique of Lagrange, and the Mecanique Celeste of Laplace: we regret that it is not in our power to refer to any English work for similar information.

DY'NASTY. *s.* (δυναστεια.) Government; sovereignty (*Hale*).

DYNASTY, among ancient historians, a race or succession of kings in the same line or family.

DYSÆ, in mythology, inferior goddesses among the Saxons, being the messengers of the great Woden, whose province it was to convey the souls of such as died in battle to his abode, called *valhall*, i.e. the hall of slaughter; where they were to drink with him and their other gods, *cerevisiæ*, or a kind of malt liquor, in the sculls of their enemies. The Dysæ conveyed those who died a natural death to *Hela*, the goddess of hell, where they were tormented with hunger, thirst, and every kind of evil.

DYSÆSTHESIÆ. (*dysæsthesia*, δυσαισθησια; from δυς, difficulty, and αισθανομαι, to feel or perceive.) The senses injured or destroyed by the imperfections of the organs. It is an order in the class locales of Cullen's nosological arrangement. See NOSOLOGY.

DYSART, a borough in Fifeshire, which has a considerable trade in coal, and is seated upon the Frith of Forth. Lat. 56. 9 N. Lon. 3. 6 W.

DYSCINESIÆ. (*dyscinesia*, δυσκινησια; from δυς, bad, and κινεω, to move.) Motion impeded, or depraved, from an imperfection of the affected organ. An order in the class locales of Cullen's nosology. See NOSOLOGY.

DISCOPHOSIS. (δυσκωφωσις; from δυς, difficulty, and κωφοω, to be deaf.) Defect in the sense of hearing: dysecœa, paracœa.

DY'SCRASY. *s.* (δυσκρασια.) An undue mixture of elements in the blood or nervous juice; a distemperature (*Floyer*).

DYSECŒA. (*dysecœa*, δυσηκοια: from δυς, difficult, and ακοη, hearing.) Hearing diminished or destroyed. A genus of disease in the class locales and order dysæsthesiæ of Cullen, containing two species: dysecœa organica, which arises from wax in the meatus, injuries of the membrane, or inflammation and obstruction of the tube: dysecœa atonica, when without any discernible injury of the organ. See NOSOLOGY.

DYSENTERY. (*dysenteria*, δυσεντερια; from δυς, difficulty, and εντερα, the bowels.) Flux. A genus of disease in the class pyrexiæ, and order profluvia of Cullen's nosology. It is known by contagious pyrexia; frequent griping stools; tenesmus; stools, chiefly mucous, sometimes mixed with blood, the natural fæces being retained or voided in a hardened state; loss of appetite, and nausea.

DYSLOCHIA. (*dyslochia*, δυσλοχια; from δυς, difficulty, and λοχια, the lochia.) A suppression of the lochia. It is thus called by Sagar: but should rather be ALLOCHIA.

DYSMENORRHŒA. (δυσμηνοῤῥοια.) Dyscatamenia; difficult or painful menstruation.

DISODIC. (δυσωδης; from δυς, bad, and οζω, to smell.) Fetid; foul of smell.

DYSOPIA. (*dysopia*, δυσοπια; from δυς, bad, and ωψ, an eye.) Sight depraved, requiring one certain quantity of light, one particular distance, or one position. A genus of disease in the class locales, and order dysæsthesiæ of Cullen, containing the five following species: 1. Dysopia tenebrarum, requiring objects to be placed in a strong light. 2. Dysopia luminis, objects only discernable in a weak light. 3. Dysopia dissitorum, in which distant objects are not perceived. 4. Dysopia proximorum, in which objects too near are not perceived. 5. Dysopia lateralis, in which objects are not seen, unless placed in an oblique position.

DYSOREXIA. (*dysorexia*, δυσορεξια; from δυς, bad, and ορεξις, appetite.) Depraved or deficient appetite. An order of diseases in the class locales of Cullen's nosology. See NOSOLOGY.

DYSPEPSIA. (δυσπεψια; from δυς, bad, and πεπτω, to concoct.) Want of appetite, accompanied by nausea, vomiting, flatulence, heartburn, costiveness, and pain in the stomach, with other symptoms of debility in the organ of digestion. It is symptomatic of schirrus, ulcer, poison, worms, chlorosis, pregnancy, gout, nephritis, &c. It is arranged by Cullen in the class neurosis, and order adynamiæ.

DYSPERMATISMUS. (*dyspermatismus*, δυσπερματισμος; from δυς, bad, and σπερμα, seed.)

Slow or impeded emission of semen during coition. A genus of disease in the class locales, and order epischesis of Cullen.

DYSPHAGIA. (δυσφαγια; from δυς, difficulty, and φαγω, to eat.) Difficulty of digestion: dispepsy.

DYSPHONIA. (*dysphonia*, δυσφωνια; from δυς, bad, and φωνη, the voice.) A difficulty of speaking.

DYSPNŒA. (*dyspnœa*, δυσπνοια; from δυς, difficult, and πνεω, to breathe.) Continual difficult respiration, without sense of stricture, and accompanied with cough through the whole course of the disease. A genus of disease in the class neuroses, and order spasmi of Cullen.

DYSTHANATOS. (from δυς, and θανατος, dying.) A word used by the ancient writers, sometimes to signify any disease which occasions a painful and slow death, and sometimes for the person dying in such a lingering manner.

DYSTHYMIA. (δυςθυμια; from δυς, bad, and θυμος, the mind.) A morbid affection of the mind or sensorium.

DYSURIA. (*dysuria*, δυσουρια; from δυς, difficult, and ουρον, urine.) Difficulty and pain in discharging the urine. A genus of disease in the class locales, and order epischesis of Cullen, containing six species: 1. Dysuria ardens, a sense of heat, without any manifest disorder of the bladder. 2. Disuria spasmodia, from spasm. 3. Dysuria compressionis, from a compression of the neighbouring parts. 4. Dysuria phlogistica, from violent inflammation. 5. Dysuria calculosa, from stone in the bladder. 6. Dysuria mucosa, from an abundant secretion of mucus.

DYTISCUS. In zoology, a genus of the class insecta, order coleoptera. Antennas setaceous; feelers six, filiform; hind legs formed for swimming, fringed on the inner side, and nearly unarmed with claws. A hundred and forty-seven species; with few exceptions all of them inhabitants of Europe; and nearly fifty natives of England. It is an aquatic genus, and is seldom seen in flight but in the evening. The following species are the most worthy of notice, for which see Nat. Hist. Pl. LXXII.

1. D. marginalis. Black; edge round the thorax and outer margin at the shells yellow. It inhabits our own country; is one of the largest of the species, usually measuring something more than an inch in length. It is generally found, and not unfrequently, in stagnant waters; as is also its larva, which is of a very extraordinary shape, and utterly unlike the future insect. The larva has more resemblance indeed to the shrimp tribe, and has, by mistake, been actually described by Mouffet, Aldrovandus, and others, as a species of this apterous insect, under the name of squilla aquatica. It measures when full grown about two inches and a half in length, and is of a pale yellowish brown colour, highly transparent. This larva is of a most ferocious disposition, committing great ravages not only among the weaker kinds of water insects, as well as water newts, tadpoles, &c. but even among fishes, of which it destroys very frequently great numbers in a season. The chrysalis resembles that of the scarabæus: and when at the point of sustaining this change the larva betakes itself to the banks of the water it inhabits, and forms for itself a hollow oval in the soft earth clay which constitute the banks. The change is effected in a few days: yet the ferocious and warlike disposition of the animal still accompanies it; it will bite when caught, or thrust into the fingers a sharp spine, with which it is at this time armed, so as to produce no small degree of pain.

2. D. cinereus. Cinereous; edge of the shells and half the thorax yellow; head black; antennas yellow; mouth yellow; body beneath black, with yellow spots on the sides. Found also in the stagnant waters of our own country. The insect and its larva considerably smaller than the last species; but possessing the same general properties and dispositions.

DYVOUR, in Scotch law, is used in the same sense as the English use the term bankrupt.

E.

E, the second vowel, and fifth letter of the alphabet. The letter E is most evidently derived from the old character Ǝ in the ancient Hebrew and Phœnician alphabets, inverted by the Greeks to this position E, and not from the Hebrew He ה. It is formed by a narrower opening of the larynx than the letter A; but the other parts of the mouth are used nearly in the same manner as in that letter.

It has a long and short sound in most languages. The short sound is audible in *bed*, *fret*, *den*, and other words ending in consonants: its long sound is produced by a final *e*, or an *e* at the end of words; as in *glebe*, *here*, *hire*, *scene*, *sphere*, *interfere*, *revere*, *sincere*, &c. in most of which it sounds like *ee*; as also in some others by coming after *i*, as in *believe*, *chief*, *grief*, *reprieve*, &c. and sometimes this long sound is expressed by *ee*, as in *bleed*, *leer*, *creed*, &c. Sometimes the final *e* is silent, and only serves to lengthen the sound of the preceding vowel, as in *rag*, *rage*, *stag*, *stage*, *hug*, *huge*, &c. The sound of *e* is obscure in the following words, *oxen*, *heaven*, *bounden*, *fire*, *massacre*, *maugre*, &c. E is the most frequent vowel in the English language; for it not only is used like the rest, but has the peculiar quality of lengthening the foregoing vowel, as *căn*, *cāne*; *măn*, *māne*.

Ea has the sound of *e* long.

E in Latin was mostly pronounced *ei*; hence the Romans in three cases of the plural number of the third declension wrote many words indifferently in *is*, *es*, or *eis*, as *partis*, *partes*, or *parteis*.

The Greeks have their long and short *e*, which they call *epsilon* and *eta*. The French have at least six kinds of *e*'s: the Latins have likewise a long and short *e*; they also write *e* instead of *a*, as *dicem* for *dicam*, &c. and this is no doubt the reason why *a* is so often changed into *e* in the preter tense, as *ago*, *egi*; *facio*, *feci*, &c.

As a numeral, E stands for 250, according to the verse,

E, quoque ducentos et quinquaginta tenebit.

In music it denotes the tone *e-la-mi*. In the kalendar it is the fifth of the dominical letters; and in sea-charts it distinguishes all the easterly points: thus, E alone denotes East; and E. by S. and E. by N. East by South, and East by North.

EACH. *pron.* (elc, Saxon.) 1. Either of two (*Dryden*). 2. Every one of any number (*Milton*).

To **Each** the correspondent word is *other*.

EAD, and **Eading**, denote happiness; *Eadgar*, happy power (*Camden*).

EAGER. *a.* (eaȝoꞃ, Saxon.) 1. Struck with desire; ardently wishing (*Dryden*). 2. Hot of disposition; vehement; ardent; impetuous (*Hooker. Sprat*). 3. Quick; busy (*Addison*). 4. Sharp; sour; acid (*Shakspeare*). 5. Keen; severe; biting (*Bacon*). 6. Brittle; inflexible (*Locke*).

EA'GERLY. *ad.* (from *eager*.) 1. With ardour of desire (*Stepney*). 2. Ardently: hotly (*Shakspeare*). 3. Keenly; sharply (*Knolles*).

EA'GERNESS. *s.* (from *eager*.) 1. Ardour of inclination (*Rogers*). 2. Impetuosity; vehemence; violence (*Dryden*).

EAGLE, in ornithology. See **Falco**.

Eagle, in heraldry, is accounted one of the most noble bearings in armoury; and, according to the learned in this science, ought to be given to none but such as greatly excel in the virtues of generosity and courage, or for having done singular services to their sovereigns; in which cases they may be allowed a whole eagle, or an eagle naissant, or only the head or other parts thereof, as may be most conformable to their exploits. The eagle has been borne, by way of ensign or standard, by several nations. The first who seem to have assumed the eagle are the Persians, according to the testimony of Xenophon. Afterwards, it was taken by the Romans; who, after a great variety of standards, at length fixed on the eagle, in the second year of the consulate of C. Marius: till that time, they used indifferently wolves, leopards, and eagles, according to the humour of the commander. The Roman eagles, it must be observed, were not painted on a cloth or flag; but were figures in relievo, of silver or gold, borne on the tops of pikes; the wings being displayed, and frequently a thunder-bolt in their talons. Under the eagle on the pike, were piled bucklers, and sometimes crowns. Thus much we learn from the medals.

Eagle, in astronomy. See **Aquila**.

The Arabian name for eagle, i. e. Nasr, is applied to several stars, as Nasr sohail, the eagle of Canopus, &c.

Eagle, in architecture, is a figure of that bird anciently used as an attribute of Jupiter, in the capital and friezes of the columns of temples consecrated to that god.

Eagles, a name found very frequently in the ancient histories of Ireland, and used to express a sort of base money that was current in that kingdom in the first years of the reign of Edward the first, that is, about the year 1272. There were, besides the eagles, lionines, rosades, and many other coins of the same sort, named according to the figures they were impressed with.

Eagle (White), is a Polish order of knighthood, instituted in 1325, by Uladislaus V. on marrying his son Casimire with a daughter of the great-duke of Lithuania.

Eagle (Black), was a like order, instituted in 1701, by the elector of Brandenburgh, on his being crowned king of Prussia.

Eagle-flower. See Balsamine.

Eagle-stone. See Ferrum Tubaquosum.

Ea'gle-eyed. *a.* (from *eagle* and *eye.*) Sharp-sighted as an eagle (*Howel*).

Ea'gle-speed. *s.* (*eagle* and *speed.*) Swiftness like that of an eagle (*Pope*).

EAGLET, a diminutive of eagle, properly signifying a young eagle. In heraldry, when there are several eagles on the same escutcheon, they are termed eaglets.

EA'GRE. *s.* (*æger*, in Runick, is the ocean.) A tide swelling above another tide (*Dryden*).

EA'LDERMAN. *s.* (ealꝺeꞃman, Saxon.) Alderman.

EAME. *s.* (eam, Saxon.) Uncle (*Fairfax*).

EAOOWE, one of the Friendly Isles, in the S. Pacific Ocean, discovered by Tasman in 1643, and by him named Middleburgh. The land gently rises to a considerable height, presenting a beautiful prospect of extensive meadows, adorned with tufts of trees, and intermixed with plantations. Lat. 21. 24 S. Lon. 174. 30 W.

EAR. *s.* (eaꞃe, Saxon.) 1. The whole organ of hearing (*Derham*). 2. The part of the ear that stands prominent (*Shakspeare*). 3. Power of judging of harmony (*Richardson*). 4. The head; or the person (*Knolles*). 5. The highest part of a man; the top (*L'Estrange*). 6. The privilege of being readily and kindly heard; favour (*Ben Jonson*). 7. Disposition to like or dislike what is heard; judgment (*Denham*). 8. Any prominence from a large body, raised for the sake of holding it (*Taylor*). I. The spike of corn; that part which contains the seeds (*Mortimer*). 10. *To fall together by the* Ears. To fight; to scuffle; to quarrel (*More*). 11. *To set by the* Ears. To make strife; to make to quarrel (*Addison*). On some of these acceptations we must enlarge, as below.

Ear (*auris*,) in anatomy and physiology, the organ of hearing; situated on the opposite sides of the head, and in the human subject is divided into external and internal ear. The *auricula*, commonly called the ear, constitutes the external, and contains several eminences and depressions, as the *helix*, *antihelix*, *tragus*, *antitragus*, *concha auriculæ*, *scapha*, and *lobulus*. The external auditory passage, containing the wax, proceeds from its middle down to the membrane of the tympanum which divides the external from the internal parts of this organ. Behind the membrana tympani is an irregular cavity, the cavity of the tympanum, in which are four little bones, the malleus, incus, stapes, and os orbiculare; and four openings, consisting of the Eustachian tube, mastoid sinus, fenestra ovalis, and fenestra rotunda. The tympanum is terminated by the labyrinth. The labyrinth is the remaining part of the internal ear, consisting of the cochlea, vestibulum, and semicircular canals. The arteries of the ear are the external and internal auditory. The veins empty themselves into the external jugulars. The muscles of the ear are divided into three classes: the common, proper, and internal. The common muscles are, attollens aurem, anterior auris, and retrahentes auris, which move the whole ear. The proper are, helicis major, helicis minor, tragicus, antitragicus, and transversus auris; these affect the part only to which they are connected. The muscles of the internal ear are, laxator tympani, tensor tympani, and stapedius, which belong to the ossicula auditus. The nerves of the external ear are branches of the nervus auditorius durus, and those of the internal ear are branches of the nervus auditorius mollis.

The organ of hearing, however, in different animals is very differently constituted. In several, and especially in some fishes, the bones of the ear are placed on the outside of the cranium: in others, as the frog, for example, the vestible or entrance into the organ is from the mouth. In man, indeed, it is partly so, for such is the termination of the Eustachian tube.

Ear, as figuratively used by musicians, implies that sensible, clear, and true perception of musical sounds, by which we are offended at dissonance and pleased with harmony. To have an ear is to be capable of distinguishing the true intonation from the false, to be sensible of metrical precision, and to feel all the nicer changes of artificial combination.

Ear-trumpet, or **Hearing trumpet**, an instrument which assists the hearing of persons dull of that faculty. This kind of instruments are formed of tubes, with a wide mouth, and terminating in a small canal, which is applied to the ear. The form evidently shews how they conduce to assist the hearing; for the greater quantity of the weak and languid pulses of the air being received and collected by the large end of the tube, are reflected to the small end, where they are collected and condensed; thence entering the ear in this condensed state, they strike the tympanum with a greater force than they could naturally have done from the ear alone.

There is, however, a method of communicating sounds to the deaf, with better success than by the common ear-trumpets, which instruments, at length, entirely destroy the sense of hearing; this is effected by means of a cylindrical rod or tube of ivory, or any similar hard substance; the rod may be from 6 to 12 inches long, or more, and from a quarter to half an inch in diameter; if it be made hollow throughout, one end, which is to be placed in the mouth between the front teeth, ought to have a much smaller aperture than the other extremity. This tube is well calculated to assist those deaf persons, who enjoy the music of a harpsichord, or other instrument. Dr. Willich, who gives this method in his Lectures on Diet and Regimen, knew a gentleman who was quite deaf, but with the assistance of a cylinder, such as here described, was enabled to hear the softest notes distinctly, and to enjoy all the pleasures of music.

Ears of a horse constitute much of his beauty, and are in some respects indicative of his disposition. If they are small, soft, and fine, curving inward in a small degree at the point, perfectly erect, and spirited in action, they give the animal a very noble, majestic, and commanding aspect: on the contrary, when a horse points his ears forwards; or instead of keeping them firm is perpetually working with them like a hog, he discovers either a mischievous intention, or a timidity that will induce him to start at every unusual or sudden object. Horses of this description are seldom remarkable for the safety of their eyes. A purchaser cannot be too circumspect in his examination of the ear before he completes his bargain. Horses having coarse, long, foul ears, set on too low, and hanging down on the sides, are called mule or lop-eared horses; and if of good form or valuable in other respects, are in general cropped to improve their appearance. The greater part of the racing stock of old. Herod, one of the best stallions ever bred in England, were foul, long, and wide in their ears, a character which is still to be seen in almost the whole of his progeny.

Trimming the ears on the inside is a very common practice, and adds considerably to the neatness and cleanliness of the head and appearance; but care should be taken never to let it be done during rainy weather, sharp and severe winds, or in the winter season; dreadful colds, as well as dangerous diseases, have often been produced by these means, without knowing from what cause the ill effect has been derived. The operation of trimming should be performed in dry, open, mild weather, and with scissars in preference to the flame of a candle; which, with the additional use of the twitch, only serves to put the poor animal to a double degree of unnecessary misery. After the ears are trimmed, they may be rubbed over on the inside with a small quantity of fresh butter, or a piece of fine linen moistened with olive oil.

EARED, in botany, auritus, auriculatus, (*auris*, an ear). Having an appendage like a little ear. Exemplified in the leaf, leaflet, and frond. Aurita folia: cordata ceterum, sed angulis prominentibus rotundatis. Eared, or more properly ear-shaped, leaves are cordate or heart-shaped, but have the corners prominent and rounded.

The diminutives earlet and earletted seem scarcely necessary.

EA'RLESS. *a.* (from *ear.*) Wanting ears. (*Pope*).

EA'RRING. *s.* (*ear* and *ring.*) Jewels set in a ring, and worn at the ears (*Sandys*).

EA'RSHOT. *s.* Reach of the ear (*Dryden*).

EA'RWAX. *s.* The cerumen or exudation which smears the inside of the ear (*Ray*).

EA'RWIG. *s.* (eaꞃe and ꝩıᵹᵹa, Saxon.) 1. A sheathwinged insect. 2. A whisperer; a prying informer.

EA'RWITNESS. *s.* (*ear* and *witness.*) One who attests, or can attest any thing as heard by himself (*Hooker*).

To EAR. *v. a.* (*aro*, Latin.) To plow; to till (*Shakspeare*).

To Ear. *v. n.* (from *ear.*) To shoot into ears.

EARL, an English title of honour, or degree of nobility, next below a marquis, and above a viscount. Earls were anciently attendants or associates of the king in his councils, and martial expeditions; much as comites, counts, were of the magistrates of Rome, in quality of deputies, to execute their offices for them.

Hence, also, earls are called, in Latin, *comites*; in French, *comtes*, counts, &c. The Germans call them *graves*, as landgrave, markgrave, palsgrave, &c. The Saxons, *ealdormen*; the Danes, *eorlas*; and the English, *earls*.

An earl is created by cincture of sword, mantle of state put upon him by the king, a cap and a coronet put upon his head, and a charter in his hand.

Originally, the title earl always died with the man. William the Conqueror first made it hereditary; giving it in fee to his nobles, and annexing it to shires or counties. For the support of the state thereof, he allotted the third penny out of the sheriff's court, issuing out of all pleas of the shire from which the earl took his title. But, of later days, the matter is much altered.

Earls are now created by patent, without any authority over, or particular relation to, their counties; and without any profit arising thence, except some annual stipend out of the exchequer, for honour-sake. The number of earls being of late much increased, and no more counties being left for them, several of them have made choice of some eminent part of a county, as Holland, Craven, &c. Others of some town, as Exeter, Bristol, &c. And others, of some village, or their own seat, park, &c. as Godolphin, Bolton, &c.

Earl marshal. See Marshal.

EA'RLDOM. *s.* (from *earl.*) The seigniory of an earl (*Spenser*).

EA'RLINESS. *s.* (from *early.*) Quickness of any action with respect to something else (*Sidney*).

EARLSTONE, a town in Berwickshire, seated on the river Leader, 35 miles S.E. of Edinburgh.

EA'RLY. *a.* (æꞃ, Saxon, before.) Soon with respect to something else (*Smith*).

Ea'rly. *ad.* Soon; betime (*Waller*).

EARN, or Earn Lough, a great lake in the county of Fermanah, in Ireland. It covers nearly one third part of the county.

To Earn. *v. a.* (eaꞃnian, Saxon.) 1. To gain as the reward or wages of labour, or any performance (*Swift*). 2. To obtain as a consequence of action (*Shakspeare*).

EA'RNEST. *a.* (eaꞃneꞅꞇ, Saxon.) 1. Ardent in any affection; warm; zealous; importunate (*Hooker*). 2 Intent; fixed; eager (*Duppa*). 3. Serious; importunate (*Hooker*).

Ea'rnest. *s.* (from the adjective.) 1. Seriousness; a serious event, not a jest; reality, not a feigned appearance (*Shakspeare*). 2. (*ernitz, penge,* Danish.) Pledge; handsel; first fruits (*Smalridge*). 3. The money which is given in token that a bargain is ratified. With us, the person who gave it is in strictness obliged to abide by his bargain; and in case he decline it, is not discharged upon forfeiting his earnest, but may be sued for the whole money stipulated.

EA'RNESTLY. *ad.* (from *earnest.*) 1. Warmly; affectionately; zealously; importunately; intensely (*Smalridge*). 2. Eagerly; desirously (*Shakspeare*).

EA'RNESTNESS. *s.* (from *earnest.*) 1. Eagerness; warmth; vehemence (*Addison*). 2. Solemnity; zeal; seriousness (*Atterbury*). 3. Solicitude; care; intenseness (*Dryden*).

EARSH. *s.* (from *ear,* to plow.) A plowed field: not in use (*May*).

EARTH. *s.* (eoꞃð, Saxon.) 1. One of the four elements of which the ancient philosophers thought the whole system of nature was composed; terrene matter. 2. The terraqueous globe; the world (*Locke*). 3. Different modifications of terrene matter. 4. This world opposed to other scenes of existence (*Shakspeare*). 5. The inhabitants of the earth (*Genesis*). 6. Country; distinct region *Dryden*). 7. (from *ear,* to plow.) The act of turning up the ground in tillage (*Tusser*).

To Earth. *v. a.* (from the noun.) 1. To hide in earth (*Dryden*). 2. To cover with earth (*Evelyn*).

To Earth. *v. n.* To retire under ground (*Tickel*).

The Earth, in astronomy and geography, this terraqueous globe or ball, which we inhabit, consisting of land and sea.

Figure of the Earth.—The ancients had various opinions as to the figure of the earth: some, as Anaximander and Leucippus, held it cylindrical, or in form of a drum: but the principal opinion was, that it was flat; that the visible horizon was the bounds of the earth, and the ocean the bounds of the horizon; that the heavens and earth above this ocean were the whole visible universe; and that all beneath the ocean was Hades: and of this same opinion were also some of the Christian fathers, as Lactantius, St. Augustine, &c. See Lactan. lib. 3, cap. 24; St. Aug. lib. 16, de Civitate Dei; Aristotle de Cœlo, lib. 2, cap. 13.

Such of the ancients, however, as understood any thing of astronomy, and especially the doctrine of eclipses, must have been acquainted with the round figure of the earth; as the ancient Babylonian astronomers, who had calculated eclipses long before the time of Alexander, and Thales the Grecian, who predicted an eclipse of the sun. It is now, indeed, agreed on all hands, unless, perhaps, by the most vulgar and ignorant, that the form of the terraqueous globe is spherical, or very nearly so.

It is an allowed principle in optics, that amongst objects at equal distances (supposing them to be equally illuminated, and that there are no intervening obstacles) those which are of the greatest bulk may be the most clearly discerned, and *vicè versa*; and that some objects of considerable magnitude may be very conspicuous, whilst smaller objects of similar materials, at an equal distance, on the same plane, cannot be seen. Now, it is frequently observed by mariners when they approach the shores of countries, wherever situated, that the points of high rocks, steeples of churches, and other thin but lofty objects, come in sight much sooner than houses and other buildings and objects, of greater magnitude but less height. In like manner, by persons on the shore, the masts and rigging of an approaching ship are discerned some time before the hull and lower parts of the vessel, though much larger, come into view. Seamen, it is well known, frequently discover distant lands from the tops of a ship's masts, long before they are visible to those who stand upon deck. These circumstances, and many others of a similar nature, immediately suggest the idea that the earth is not a vast plane interspersed with hills, dales, and seas, but of some curvilinear figure, the convexity of which rises up and prevents the prospect of distant objects. And since circumstances alike both in kind and degree have thus been observed on all known parts of the earth, it is natural to infer that it is in the shape of a solid of regular and equal curvature, or that it is a sphere.

To these observations we must likewise add, that several navigators have sailed quite round the earth; not in an exact circle, it is true, for this the winding of the shores would not admit of; but going in and out as the shores happened to lie, they have held on the same course, and arrived at their native country on a different side from that on which they first began their voyage: thus Ferdinand Magellan, setting out on the west side of Spain, continued shaping his course westward, till he returned home on the south-eastern side of Spain; and thus, also, have Drake, Dampier, Cooke, and others, circumnavigated the earth: and when, in addition to all these facts, it is recollected, that all the rules of navigation are conformable to the opinion of the earth being nearly globular, and that these rules never lead the mariner into material error, even in the longest and most complicated voyages; these well-known circumstances, without adducing others, though others equally or more forcible might be adduced, (as from eclipses, levelling, &c.) must sufficiently establish the belief in the mind of every impartial and competent judge, that the earth deviates but very little in its form from that of a sphere. See Astronomy.

The natural cause of this sphericity of the globe is, according to sir Isaac Newton, the great principle of attraction, which the Creator has stamped on all the matter in the universe; and by which all bodies, and all the parts of bodies, mutually attract one another. And the same is the cause of the sphericity of the drops of rain, quicksilver, &c.

What the earth loses of its sphericity by mountains and valleys, is nothing considerable; the highest eminence being scarce equivalent to the minutest protuberance on the surface of an orange. Its difference from a perfect sphere, however, is more considerable in another respect, by which it approaches nearly to the shape of an orange, or to an oblate spheroid, being a little flatted at the poles, and raised about the equatorial parts, so that the axis from pole to pole is less than the equatorial diameter. What gave the first occasion to the discovery of this figure of the earth, were the observations of some French and English philosophers in the East Indies, and other parts, who found that pendulums, the nearer they came to the equator, performed their vibrations slower: from whence it follows, that the velocity of the descent of bodies by gravity is less in countries near to the equator; and, consequently, that those parts are farther removed from the centre of the earth, or from the common centre of gravity. See the History of the Royal Academy of Sciences, by du Hamel, pp. 110, 156, 206; and l'Hist. de l'Acad. Roy. 1700 and 1701. This circumstance put Huygens and Newton upon finding out the cause, which they attributed to the revolution of the earth about its axis. If the earth were in a fluid state, its rotation round its axis would necessarily make it put on such a figure, because the centrifugal force being greatest towards the equator, the fluid would there rise and swell most; and that its figure really should be so now, seems necessary, to keep the sea in the equinoctial regions from overflowing the earth about those parts. See this curious subject well treated by Huygens, in his discourse De Causa Gravitates, p. 154, where he states the ratio of the polar diameter to that of the equator, as 577 to 578. And Newton, in his Principia, first published in 1686, demonstrates, from the theory of gravity, that the figure of the earth must be that of an oblate spheroid generated by the rotation of an ellipse about its shortest diameter, provided all the parts of the earth were of an uniform density throughout, and that the proportion of the polar to the equatorial diameter of the earth would be that of 689 to 692, or nearly that of 229 to 230, or as ·9956522 to one.

This proportion of the two diameters was calculated by Newton in the following manner: Having found that the centrifugal force at the equator is $\frac{1}{289}$th of gravity, he assumes, as an hypothesis, that the axis of the earth is to the diameter of the equator as 100 to 101, and thence determines what must be the centrifugal force at the equator to give the earth such a form, and finds it to be $\frac{4}{505}$ths of gravity: then, by the rule of proportion, if a centrifugal force equal to $\frac{4}{505}$ths of gravity would make the earth higher at the equator than at the poles by $\frac{1}{100}$th of the whole height at the poles, a centrifugal force that is the $\frac{1}{289}$th of gravity will make it higher by a proportional excess, which by calculation is $\frac{1}{229}$th of the height at the poles; and thus he discovered that the diameter at the equator is to the diameter at the poles, or the axis, as 230 to 229. But this computation supposes the earth to be every where of an uniform density; whereas if the earth is more dense near the centre, then bodies at the poles will be more attracted by this additional matter being nearer; and therefore the excess of the semi-diameter of the equator above the semi-axis, will be different. According to this proportion between the two diameters, Newton farther computes, from the different measures of a degree, that the equatorial diameter will exceed the polar by 34 miles and ½.

In opposition to the deductions of Newton, Messrs. Cassini, both father and son, M. Mairan, and M. J. Bernouilli, attempted to prove that the earth was an oblong spheroid; and many positive assertions were made in contradiction of the opinion of that great philosopher. But in 1735 two companies of mathematicians were employed, one for a northern, and another for a southern expedition, the result of whose observations and measurement plainly proved that the earth was flatted at the poles. See DEGREE.

The proportion of the equatorial diameter to the polar, as stated by the gentlemen employed on the northern expedition for measuring a degree of the meridian, is as 1 to 0·9891; by the Spanish mathematicians as 266 to 265, or as 1 to 0·99624; by M. Bouguer as 179 to 178, or as 1 to 0·99441.

Indeed, if in any case fair reasoning from the nature of things could be allowed to determine, independent of experiment, the decision on this ground would be completely in favour of Newton. For it is easy to shew that if the earth were of an oblong spheroidical figure, the axis of its revolution would either go through one of its short diameters, or be continually changing, unless the said axis exactly coincided with the longer axis of the figure. Thus: suppose such an oblong figure as *Aa* (fig. 5. Pl. 5.) fixed to the axis *Pp* at the centre C, but capable of moving freely round it towards either P or *p*, yet so as to be obliged to move with the axis when it turned round. Suppose now, the poles P, *p*, to be fixed, and the body, thus constituted, to be turned swiftly round the axis *p*P: then, if the angle ACP be oblique, and the figure AD*a*E oblong, the parts AC and C*a* will acquire a centrifugal force, which must necessarily enlarge the angle *p*CA till it becomes a right angle. Besides this, a velocity will be generated in the motion, while A is going towards the perpendicular C*c*, which will cause it to proceed farther, as to B, with a motion which will then be retarded till the centrifugal force is sufficient to send it back again the contrary way: and thus it will continue to move like the oscillations of a pendulum; until, at length, a little motion being lost at each oscillation, the oblong figure AD*a*E will move quietly about its less axis DE coinciding with *p*P. That A*a* could never exactly coincide with P*p* in the earth is more than probable, because the unequal distribution of sea and land, besides the phænomena of the tides, must make the axis of its gravity, and consequently that of its revolution, to differ from the axis of the oblong spheroid, if the earth had such a figure: without considering that every earthquake would also notice an equilibrium, which once lost, could never be recovered again. (*Phil. Transac. No.* 388.)

In the new Petersburgh Acts, for the years 1788 and 1789, are accounts and calculations of experiments relative to this subject by Mr. Krafft. These experiments were made at different times and in various parts of the Russian empire. This gentleman has collected and compared them, and drawn the proper conclusions from them: thus he infers that the length x of a pendulum that swings seconds in any given latitude λ and in a temperature of 10 degrees of Reaumur's thermometer, may be determined by this equation:

$x = 439{\cdot}178 + 2{\cdot}321 \text{ sine } {}^2\lambda$, lines of a French foot,

or $x = 39{\cdot}0045 + 0{\cdot}206 \text{ sine } {}^2\lambda$, in English inches, in the temperature of 53 of Fahrenheit's thermometer.

This expression nearly agrees, not only with all the experiments made on the pendulum in Russia, but also with those of Mr. Graham in England, and those of Mr. Lyons in 79° 30′ north latitude, where he found its length to be 431·38 lines. It also shews the augmentation of gravity from the equator to the parallel of a given latitude λ: for,

putting g for the gravity under the equator, G for that under the pole, and y for that under the latitude λ, M. Krafft finds
$y=(1+0{\cdot}0052848 \text{ sine } ^2\lambda)g$; and therefore $G=1{\cdot}0052848\,g$.

From this proportion of gravity under different latitudes, the same author infers that, in case the earth is a homogeneous ellipsoid, its oblateness must be $\frac{1}{191}$; instead of $\frac{1}{230}$, which ought to be the result of this hypothesis: but on the supposition that the earth is a heterogeneous ellipsoid, he finds its oblateness, as deduced from these experiments, to be $\frac{1}{297}$; which agrees with that resulting from the measurement of some of the degrees of the meridian. This confirms an observation of M. De la Place, that, if the hypothesis of the earth's homogeneity be given up, then theory, the measurement of degrees of latitude, and experiments with the pendulum, all agree in their result with respect to the oblateness of the earth. See Memoires de l' Acad. 1783, p. 17.

The different lengths of pendulums vibrating in different latitudes in any assumed unit of time, reduced to the same temperature, and to the level of the sea, afford another means of appreciating the exact figure of the earth. M. Laplace has lately given a method to ascertain the ellipse generating the terrestrial spheroid, so that the two following conditions shall be fulfilled: 1st. That the sum of the errors committed in the measures from the second pendulum shall be nothing. 2. That the sum of those errors, all taken positively, shall be a minimum.

In order to this, let a', a'', a''', &c. represent the length of the second's pendulum: make k', k'', k''', &c. the squares of the sines of the corresponding latitudes; and suppose that the lengths of the pendulum are expressed by the formula $z+ky$. Calling x', x'', x''', &c. the errors of the observations, we shall have the following equations:

$$\left.\begin{aligned} &a'-z-k'y=x' \\ &a''-z-k''y=x'' \\ &a'''-z-k'''y=x''' \\ &\dots\dots\dots\dots \\ &a^{(n)}-z-k^{(n)}y=x^{(n)} \end{aligned}\right\}(A)$$

If these equations be added together, and their sum divided by their number n, we shall, by making the quotient equal to zero, find a result of the form

$$o=A-z-Ky. \quad (B)$$

Such is the condition that must be satisfied when the sum of the errors is nothing.

Now if this equation be subtracted from each of the equations (A), we shall obtain new equations of the following form:

$$\left.\begin{aligned} &b'-q'y=x' \\ &b''-q''y=x'' \\ &b'''-q'''y=a''' \ \dots \ \&c. \end{aligned}\right\}(O)$$

Form the series of quotients $\frac{b'}{q'}$, $\frac{b''}{q''}$, $\frac{b'''}{q'''}$, &c. and dispose them according to the order of their magnitude, neglecting the signs, and commencing with the greatest: represent these quotients, thus arranged, by

$$h',\ h'',\ h''',\ \&c. \dots \quad (P)$$

and observe in what order they correspond with the first members of the equations (O).

This done, to obtain the value of y, which reduces to a minimum the sum of the errors all taken positively, we must add the quantities h', h'', h''', &c. until their sum begins to surpass the half sum of all those quantities: thus, calling F that sum, we must determine r in such manner that we shall have

$$\left.\begin{aligned} &h'+h''+h''' \dots +h^{(r)} > \tfrac{1}{2}F \\ &h'+h''+h''' \dots\dots h^{(r-1)} < \tfrac{1}{2}F \end{aligned}\right\}(2)$$

and then will $y=h^{(r)}$; because, according to the method actually practised, it is requisite to make the error nothing relative to the length of the pendulum which corresponds to that of the equations (O), of which the first member equal to zero gives that value of y. Then we shall have z by means of the equation

$$z=A-Ky.$$

Laplace, applying this kind of analysis to the fifteen principal determinations of the length of the pendulum in different latitudes, finds
$y=0{\cdot}0056724 \dots z=0{\cdot}99676$.
Now, it is demonstrated, in No. 34 of the Mécanique Celéste, tome ii. that the compression of the earth is equal to $\frac{5}{2}$ of the ratio of the centrifugal force to gravity *minus* the value of y: whence, this ratio being $\frac{1}{289}$, it follows that the compression, taking the minor axis of the earth for unit, is

$$\alpha=0{\cdot}00865-y=\frac{1}{335{\cdot}78};$$

a result which accords remarkably with the ellipticity deduced from the measures in France and at the equator.

The length λ of the centesimal-second's pendulum, expressed in metres for any latitude L, agreeably to the above compression, is

$$\lambda=0^{m}{\cdot}739502+0{\cdot}^{m}004208 \sin^2 L.$$

We shall now give some idea of the analytical processes, by which the figure of the earth is deduced from actual measurements of degrees. If the earth be an ellipsoid of revolution, then all the meridians will be ellipses, whose minor axes will be the axis of the poles, and the major equal that of the equator: calling the former b, the latter a, and denoting by y and x the rectangular co-ordinates, which are respectively parallel to them, the equation of those meridians will be

$$a^2y^2+b^2x^2=a^2b^2.$$

Their radius of curvature R will be expressed by

$$R=\frac{[a^4-x^2(a^2-b^2)]^{\frac{3}{2}}}{a^4b},$$

and very small arcs measured on meridians, may be considered as appertaining to the osculatory circle, whose radius is R.

Observations make known the abscissa x; but we may deduce it from the latitude, when the radius drawn from the centre of the spheroid to the point in question is known: for, naming r that radius, and φ the latitude, or the angle formed by r, with the major axis, we have

$$x=r\cos\varphi$$

and from thence

$$R=\frac{[a^4-r^2(a^2-b^2)\cos^2\varphi]^{\frac{3}{2}}}{a^4b}$$

Suppose, now, that $\frac{a-b}{b}=\alpha$, then will α be the compression of the spheroid; and it may be considered as a very small fraction, of which all powers superior to the first may be neglected. Hence we may deduce

$$a = b(1+\alpha)$$

$$a^2 - b^2 = b^2[(1+\alpha)^2 - 1] = 2b^2\alpha.$$

If α were nothing, the ellipsoid would become a sphere, and r would be always equal to a. If these differ, it can only be proportionally to the compression of the ellipse; and consequently the difference will always be very small, and of the same order as α. But the radius r in the expression of R, is always multiplied by $a^2 - b^2$ or by $2b^2\alpha$: thus, provided we may neglect the square of α, it is unnecessary to have regard to the difference between r and a, and we may substitute a for r. Then will

$$R = \frac{[a^2 - (a^2 - b^2)\cos^2\varphi]^{\frac{3}{2}}}{ab}$$

Or, substituting for a its value, and retaining only first powers of α,

$$R = b\frac{(1 + 2\alpha\sin^2\varphi)^{\frac{3}{2}}}{1+\alpha}.$$

Developing the numerator of this expression by the binomial theorem, it will become

$$= 1 + 3\alpha\sin^2\varphi + \text{ \&c.}$$

and by the ordinary division

$$\frac{1}{1+\alpha} = 1 - \alpha + \text{ \&c.}$$

These two expressions being multiplied together, and retaining only the first powers of α, we shall have, ultimately,

$$R = b\,[1 - \alpha\,(1 - 3\sin^2\varphi)].$$

In this expression the only variable quantity is $\sin\varphi$. If the compression became evanescent, we should have $R = b$, the meridians would become circles, and all the radii of curvature would be respectively equal. In the case we are considering, they differ from each other by the term $3ab\sin^2\varphi$; where the sine of the angle φ, which is the latitude, augments constantly from the equator to the pole. We see, therefore, that the radii of curvature go on increasing in the same direction proportionally to the square of the sine of the latitude: and as the arcs which correspond to the same number of degrees in different circles are proportional in length to the radii of those circles, it follows that the degrees of the meridian augment, likewise, from the equator to the pole, in the same ratio.

Considering now the arc of a degree measured upon the spheroid in the latitude φ, and representing it by c. R being the radius of curvature, $2\pi R$ will be the circumference of the circle of which the arc c measures a degree. We shall have, therefore,

$$360c = 2\pi R, \text{ or } R = \frac{360c}{2\pi}.$$

Then the preceding equation will become,

$$\frac{360c}{2\pi} = b\,[1 - \alpha\,(1 - 3\sin^2\varphi)]$$

Let c' be an arc of another degree measured in latitude φ'; we shall have in like manner

$$\frac{360c'}{2\pi} = b\,[1 - \alpha(1 - 3\sin^2\varphi')].$$

Dividing these equations, member by member, we obtain

$$\frac{c}{c'} = \frac{1 - \alpha\,(1 - 3\sin^2\varphi)}{1 - \alpha\,(1 - 3\sin^2\varphi')};$$

an equation which contains no other unknown quantity than the compression α; and which, as the terrestrial ellipsoid differs so little from a sphere, may be still farther simplified, by expanding and neglecting the square of α; whence we have

$$\frac{c}{c'} = 1 - 3\,\alpha\,(\sin^2\varphi - \sin^2\varphi');$$

or, finally,

$$\alpha = \frac{c' - c'}{3c'(\sin^2\varphi' - \sin^2\varphi)}$$

This formula applied to the degree measured at the equator by Bouguer, and that of France measured by Delambre and Mechain, gives

$$\alpha = \frac{1}{334}$$

$b = 3261443$ toises, $a = 3271208$ toises;

and $a - b = 9765$ toises.

The degree measured at Quito, with the degree measured recently in Lapland by Svanberg, gives $\alpha = \frac{1}{309{\cdot}4}$. The compression deduced from the theory of gravity as applied to the latest observations of Burg, Maskelyne, &c. is $\alpha = \frac{1}{305{\cdot}05}$. Svanberg's observations compared with Bouguer's give $\alpha = \frac{1}{334{\cdot}295}$; or, allowing for refraction, agreeably to Prony's method, $\frac{1}{329{\cdot}246}$. Svanberg's, compared with the degree of Delambre and Mechain, gives $\alpha = \frac{1}{307{\cdot}405}$. This degree compared with the late East Indian degree of Major Lambton, gives $\alpha = \frac{1}{307{\cdot}167}$. The most probable compression in the opinion of Svanberg, is $\frac{1}{323}$ or $\frac{1}{324}$; which he obtains by a diminution of 14 metres from the degree of Peru, an augmentation of 24^m to that of India, and of 2^m to the French degree. See our articles DEGREE and ELLIPTICITY.

Mr. Professor Playfair, in vol. v. of the Edinburgh Trans. enters into the enquiry why, considering the care with which observations have been made, they do not agree more nearly in the results. Among the causes of this inconsistency, besides unavoidable mistakes and the imperfections of instruments, the professor mentions local irregularities in the direction of gravity, particularly those occasioned by the attraction of mountains. "There are," says he, "no doubt, situations, in which the measurement of a small arch might, from this cause, give the radius of curvature of the meridian *infinite*, or even *negative*." Another kind of local irregularity is that arising from the unequal density of the materials under the surface of the earth, and not far from it: errors thus produced might amount to 10″ or 12″. And this cause of error is the more formidable, [illegible] not only because it may go to a great extent, [illegible] because there is not any visible mark by whi[illegible] existence can always be distinguished. The professor also justly observes, that in order to avoid any material error in determining the figure of the earth, the arches measured should be large, consisting each of several degrees, as an error would then be rendered inconsiderable, by being spread out over a greater interval. We refer to Mr. Playfair's paper for some ingenious formulas for ascertaining the proportion of the earth's axes, from different kinds of admeasurement. The reader may also consult bishop Horsley's Tracts; Robertson's Navigation; the papers of Williams, Dalby, and Mudge, in the Philosophical Transactions, relative to the Trigonometrical Survey; Nicholson's Journal, Nos. 29, 31. N. S.; Svanberg, Exposition des Operations faites en Lapponie, &c.; Delambre, &c. Base du Système Métrique décimal; Puissant, Geodesie, Topographie, &c. in several of which the principal geodesic operations and analytic formula are explained with considerable perspicuity.

Changes of the Earth.—Mr. Boyle suspects that there are great, though slow, internal changes in the mass of the earth. He argues from the varieties observed in the change of the magnetic needle, and from the observed changes in the temperature of climates. But as to the latter, there is reason to doubt that he could not have diaries of the weather sufficient to direct his judgment. Boyle's Works abr. vol. i. p. 292, &c.

Magnetism of the Earth.—The notion of the magnetism of the earth was started by Gilbert; and Boyle supposes magnetic effluvia moving from one pole to the other. See his Works abr. vol. i. p. 285, 290.

Dr. Knight also, thinks that the earth may be considered as a great loadstone, whose magnetical parts are disposed in a very irregular manner; and that the south pole of the earth is analogous to the north pole in magnets, that is, the pole by which the magnetical stream enters. See MAGNET and MAGNETISM.

He observes, that all the phenomena attending the direction of the needle, in different parts of the earth, in great measure correspond with what happens to a needle, when placed upon a large terrella; if we make allowances for the different dispositions of the magnetical parts, with respect to each other, and consider the south pole of the earth as a north pole with regard to magnetism. The earth might become magnetical by the iron ores it contains, for all iron ores are capable of magnetism. It is true, the globe might notwithstanding have remained unmagnetical, unless some cause had existed capable of making that repellent matter producing magnetism move in a stream through the earth.

Magnitude and Constitution of the Earth.—This has been variously determined by different authors, both ancient and modern. The usual way has been, to measure the length of one degree of the meridian, and multiply it by 360, for the whole circumference. (See DEGREE.) Diogenes Laertius informs us, that Anaximander, a scholar of Thales, who lived about 550 years before the birth of Christ, was the first who gave an account of the circumference of the sea and land; and it seems his measure was used by the succeeding mathematicians, till the time of Eratosthenes. (See ERATOSTHENES.) Aristotle, at the end of [illegible] ii. De Cœlo, says, the mathematicians who [illegible] attempted to measure the circuit of the earth, make it 40,000 stadiums: which it is thought is the number determined by Anaximander.

The results of many other measurements are upon record; from the mean of all which, the following dimensions may be taken as near the truth:

the circumference	25000 miles,
the diameter	7957¾ miles,
the superficies	198944206 square miles,
the solidity	263930000000 cubic miles.

Also the seas and unknown parts of the earth, by a measurement of the best maps, contain 160522026 square miles; the inhabited parts 38922180; of which Europe contains 4456065; Asia, 10768823; Africa, 965.807; and America, 14110874. If the earth be considered as a spheroid, the axes may be stated at about 7950 and 7977 miles respectively.

The terraqueous globe is distinguished into three parts or regions, viz. 1st, The external part or crust, being that from which vegetables spring and animals are nourished. 2d, The middle, or intermediate part, which is possessed by fossils, extending farther than human labour ever yet penetrated. 3d, The internal or central part, which is utterly unknown to us, though by many authors supposed of a magnetic nature; by others, a mass or sphere of fire; by others, an abyss or collection of waters, surrounded by the strata of earth; and by others, a hollow, empty space, inhabited by animals, that have their sun, moon, planets, and other conveniences within the same. But others divide the body of the globe into two parts, viz. the external part, called the cortex, including the internal, which they call the nucleus, being of a different nature from the former, and possessed by fire, water, or more probably by a considerable portion of metals, as it has been found, by calculation, that the mean density of the whole earth is near double the density of common stone. See Hutton's determination of it, Philos. Trans. 1778, p. 781.

The external part of the globe either exhibits inequalities, as mountains and valleys; or it is plane and level; or dug in channels, fissures, beds, &c. for rivers, lakes, seas, &c. These inequalities in the face of the earth most naturalists suppose have arisen from a rupture or subversion of the earth, by the force either of the subterraneous fires or waters. In this part of the earth there appear various strata, supposed the sediments of several floods; the waters of which, being replete with matters of divers kinds, as they dried up, or oozed through, deposited these different matters, which in time hardened into strata of stone, sand, coal, clay, &c. See GEOLOGY.

Motion of the Earth.—It is now universally agreed that, besides the small motion of the earth which causes the precession of the equinoxes, the earth has two great and independent motions; viz. the one by which it turns round its own axis, in the space of twenty-four hours nearly, and causing the continual succession of day and night; and the other an absolute motion of its whole mass in a large orbit about the sun, having that luminary for its centre, in such manner that its axis keeps always parallel to itself, inclined in the same angle to its path, and by that means causing the vicissitudes of seasons, spring, summer, autumn, winter.

It is indeed true that, as to sense, the earth appears to be fixed in the centre, with the sun, stars, and heavens, moving round it every day; and such doubtless would be considered as the true nature of the motions in the rude ages of mankind, as they are still by the rude and unlearned. But to a thinking and learned mind, the contrary will soon appear. We shall not adduce many arguments in support of this position. It is manifest, from constant observation, that either the earth is at rest, and all the heavenly bodies perform their revolutions daily in circles parallel to each other, their several centres falling in the axis of the earth or heavens; or, that these celestial bodies, or the greater part of them, are at rest, and the earth revolves daily about one of its diameters as an axis. But that the first of these is highly improbable, may be thus shewn: Both the theory and practice of mechanics teach us, that forces are directed to some central body on which they physically depend; that the force of gravity decreases inversely as the square of the distances from its centre; and that when various bodies in a system revolve, their motions are performed about their common centre of gravity: the heavenly bodies are at widely different distances from the earth (varying from about forty millions of miles, to an almost infinitely greater distance); and all these bodies, on this supposition, must move round the earth, or its axis produced, in twenty-four hours; and, besides this, the fixed stars, as appears by the precession of the equinoxes, have another motion round the axis of the ecliptic in about 25920 years: so that, if the earth be fixed, an innumerable multitude of bodies (for such telescopic observations shew the stars to be) are daily moved with wonderful rapidity by forces directed to innumerable imaginary points on which they cannot possibly depend; and those forces must increase exactly in proportion to the distance from the imaginary centres, or they cannot all revolve in the same *time*; this is directly contradictory to the established laws of motion and gravity, and is, therefore, inadmissible. This is sufficient to prove the reality of the earth's diurnal motion; and as to the annual motion, the discovery of the aberration of light establishes this point beyond controversy.

The nature and effects of the earth's diurnal rotation are traced out under the word DIURNAL. But while the earth is thus turning on its axis, it is at the same time carried by its proper motion in its orbit round the sun, as one of the planets, namely, between the orbits of Venus and Mars, having the orbits of Venus and Mercury within its own, or between it and the sun, in the centre, and those of Mars, Jupiter, Saturn, &c. without or above it; which are therefore called superior planets, and the others the inferior ones. This is called the annual motion of the earth, because it is performed in a year, or 365 days, 6 hours nearly; or rather 365 days, 5 hours, forty-nine minutes, from any equinox or solstice to the same again, making the tropical year; but from any fixed star to the same again, as seen from the sun, in 365 days, 6 hours, 9 minutes, which is called the sidereal year. The figure of this orbit is elliptical, having the sun in one focus, the mean distance being about 95 millions of miles. This annual motion is so performed, that the earth's axis is every where parallel, or in the same direction in every part of the orbit; by which means it happens, that at one time of the year the sun enlightens more of the north polar parts, and at the opposite season of the year, more of the southern parts, thus shewing all the varieties of seasons, spring, summer, autumn, and winter. See SEASONS.

The direction of the earth's motion, in its orbit, is upwards in the morning, westward at noon, downwards in the evening, and eastwards at midnight. Therefore, if a body were projected from its surface to arrive at the sun, it must not be towards his disk, for its motion would then be compounded with the annual motion of the earth. But if a ball were projected eastwards at noon, upwards in the evening, or westward at midnight, with a velocity equal to that of the earth in its orbit, it would be at rest in the solar system, and the earth would immediately abandon it. Upon the earth's return a year afterwards, it would meet with the body at rest, were it not for the sun's attraction; but by its force, the ball would in about 64½ days fall into the body of the sun. (*Woolsey's Celestial Companion*, p. 13.)

Age of the Earth.—On this subject there have been many different opinions, and many warm disputes. Aristotle thought the earth was eternal; and Parmenides, Pythagoras, and the Chaldeans, were of the same opinion: but the generality of philosophers, as well as divines and historians, have always held an origin of it; though where to fix that origin, is the difficulty. The different systems of the chronology of the Greeks, the Egyptians, the Jews, the Hebrew text, and the Septuagint version of Scaliger, of Pezron, of sir Isaac Newton, &c. to say nothing of the Chinese annals, leave the point much embarrassed.

Some have proposed to trace up the antiquity of the earth, by an observation of the saltness of the sea; others by observing the elevation of the bottom of the sea, or the growth of its strata. But these methods must from their nature be very precarious and unsatisfactory.. Others again, as Recupero, suggest an argument for the very great age of the earth, from observations on the lava of Ætna: but sir W. Hamilton proves very clearly that this kind of argument is fallacious.

The French have found in Egypt, on some ancient monuments, different figures of the zodiac, which, supposing them to be originally formed when the heavens had a corresponding position, tended to give to the earth a much higher origin than our received chronology attributes to it. According to some philosophers, we must go back from the present period 15,000 years; and even then we shall only arrive at the time in which the figures of the zodiac were contrived: but the world may have undergone many previous revolutions.

With all the semblance of sagacity and truth which accompanies this mode of argument, nothing can be more unphilosophical than the inference. Is it not an admitted fact, that one of the first efforts of astronomers, after their science had attained a certain degree of perfection, was to draw from it such modes of arrangement and calculation as might be useful in adjusting the current time; and that the period from which they supposed their account to set out was in a great measure arbitrary, depending on the multiplication of cycles into each other, counting backward from any position of the heavenly bodies in the then current age, to the period in which these bodies (according to their tables) must have stood in a position fitting the purpose they had in view?

Besides, the evidence adduced in different papers in the Asiatic Researches amount almost to a demonstration that, excepting a period which accords very well with the Scripture accounts, the whole Bramin chronology of myriads of years is merely a clumsy astronomical fiction, which at first was not even intended to deceive.

We may also state here another well known fact,—that it was long a favourite opinion with astrologers, that all the planets must have been in conjunction in the first scruple of the sign Aries when the world was made; because then, according to them, was the proper time to begin a year! Others might have been for a different arrangement, i. e. a differently constructed zodiac; but whichever had the greatest number of suffrages at any period, can never prove any thing as to the point in question.

The strongest argument in favour of the extreme age of the world has been derived from the Chinese chronology. Now, a remarkable period marked in their annals, as occurring almost at the very origin of their history, is described as attended by a conjunction of the sun, moon, and several planets. Cassini, the celebrated French astronomer, anxious to know the truth of this, calculated backwards, and thence discovered an error of several hundred years in the Chinese chronology; for he satisfactorily proved that such an extraordinary conjunction of the planets did actually happen on the 25th of February, 2012 years before Christ: that is, in the fourth century after the general deluge, in the days of Noah and his sons, a little after the birth of Abraham. So that the boasted antiquity of the Chinese chronology is compelled, by proofs of its own recording, to contract itself within the compass of the Mosaic history, and to come in establishment of the veracity of the sacred records.

But we shall not enter farther into this discussion; for we are convinced that no arguments have yet been advanced by the most ingenious opponents of the received chronology, which afford sufficient reasons to justify our abandoning it.

EARTH, in chemistry. While the philosopher has employed this term to express the entire mass of which the globe we inhabit consists, or as a name by which to distinguish this globe from the other planets that constitute the solar system, the chemist has, in almost all ages, given it a different and more restrained signification; and has selected it to denote some particular and elemental substance, of which the great mass of the terrestrial globe, and perhaps of matter in general, is composed. Under the different systems of philosophy in ancient Greece, these elements, or elemental substances, differed very materially in number: Pythagoras, and especially his renowned scholar Empedocles, resolved them into four, and hereby established a system, which has never been altogether subverted to the present hour; these four elements being fire, air, earth, and water. Other Grecian philosophers, however, supposed only one, two, or three, of these four, to be strictly elemental, and the remainder to issue by a variation in the structure or combination of the elemental parts: while Epicurus denied that any of these substances were strictly elemental, and contended that each equally flowed, like every other compound body, from a mere peculiarity in the combination or structure of the common and primary or elemental atoms, which constitute the basis of the visible world. See CORPUSCULAR SYSTEM.

This part of the Epicurean theory has at length obtained a complete triumph. Yet the term earth is still retained in chemistry, to signify a certain class, not indeed of elemental, but of compound bodies; the composition of which, however, has hitherto resisted all analysis; whence such substances may be still regarded as comparatively simple; and are peculiarly characterised in modern chemistry by the phrase undecompounded bodies. Earth, in this sense of the term, is no longer opposed to water, to air, or even to fire, in the precise idea of it understood by the Greek philosophers, for these are all compound bodies, easily capable of decomposition; the opposites of earth, in modern chemistry, are sulphur, carbon, metals, light, oxygen, hydrogen, azot, caloric, and various other substances, regarded as simple, not merely because they have not hitherto been analysed, but because no phænomenon hitherto observed indicates them to be compounds.

The mineralogist, who is often guided, in a very considerable degree, by the external and more obvious characters of a substance, usually exhibits a very long catalogue of earths in his general classification, in consequence of a variation in these characters. For earths, regarded in this point of view, see the article MINERALOGY. The chemist, on the contrary, who confines himself almost entirely to the constituent principles of a substance, as they appear upon minute and patient analysis, very considerably reduces the number, in his own mode of arrangement; and the whole of the earths we are yet acquainted with, in a chemical view of the subject, are reducible to nine, and consist of the following:

Lime,
Magnesia, } Alkaline.
Barytes,
Strontian,
Alumina,
Glycina,
Zirconia, } Proper.
Silica,
Yttria,

All these agree in the following characters, which agreement alone entitles them to the chemical denomination of earths.

1. They are all insoluble in water, or nearly so; or at least they become insoluble when combined with carbonic acid.

2. They have little or no taste or smell; at least when combined with carbonic acid.

3. They are fixed, incombustible, and incapable while pure of being altered by the fire.

4. Their specific gravity does not exceed 4.9.

5. When pure, they are capable of assuming the form of a white powder.

6. They are not altered when heated with combustibles.

These earths are divided into two classes, alkaline earths, and proper earths: the first four in the above catalogue appertain, as we have there marked them, to the former class; the last five to the latter class. And it would be more scientific that this latter class alone should be denominated earths, as in that case the distinguishing characters would apply to each without any modification whatever.

Alkaline earths have a very near resemblance to fixed alkalies, and seem to form the connecting link between these and the proper earths. They are distinguished by the property of giving a green colour to vegetable blues, and of neutralizing acids. Proper earths, on the contrary, do not alter vegetable blues, and are incapable of neutralizing acids.

If such an arrangement were generally adopted, and it has been partially adopted by Fourcroy, genuine or chemical earths would then be thus characterized. They are infusible, and insoluble in water, and have neither taste nor smell: they exhibit neither acid nor alkaline characters: they combine with acids, and with alkalies either pure or carbonated: they have no action on metallic substances, and are incapable of assuming the reguline form.

A considerable stir was made a few years ago in Hungary, by the pretended metallization of several of the earths by M. M. Ruprecht and Tondi, till their experiments were repeated by Klaproth and others, and shown to be entirely fallacious. The chemists first mentioned took a small quantity of any earth, barytes for example, and having beaten it up with a little water and charcoal, smeared it on the inside of a Hessian crucible; the cavity was then filled with powdered charcoal, and at the top of all was placed a layer of bone ash; a cover being then luted on, the crucible was exposed for three quarters of an hour to a blast furnace, in which it was heated almost to a state of pasty fusion. When the contents of the crucible were examined, the barytes was found in part melted with the earth of the crucible, and containing from two to four per cent. of brittle metallic globules, which were supposed to have originated from a decomposition of part of the barytes. These globules, however, on analysis by Klaproth, proved to be nothing more than phosphuret of iron; the metallic part doubtless originating from the iron contained in the earth of the crucible, and the phosphorus from the bone ash by means of the charcoal. That this is the true explanation of the appearance is evident from another experiment of Klaproth, in which he repeated the process of Ruprecht, only substituting a porcelain for a Hessian crucible; but the earth of this crucible contained no iron, and there was not the slightest appearance of metallic globules in the barytes which it contained. Further, the experiment was again repeated in a Hessian crucible, only leaving out the barytes, and the globules made their appearance as plentifully as when the barytes was present.

Earths, in mineralogy, one of the classes of which this science is composed: divided into different orders and genera, according to the different systems of different mineralogists. In the original system of Linnéus, they merely form an order of the class fossils; but this is the only system in which they are thus introduced; and in Gmellin's improvement of the Linnéan arrangement, which is that we have preferred to follow, they are restored to their common rank. See Mineralogy.

Earth (Absorbent). See Absorbents.

Earth (Aluminous). Earth which contains alum. This is found in several parts of England, Scotland, and many other places. See Alumen.

Earth (Animal calcareous). This term is applied to crabs claws, &c. which are calcareous earth, and obtained from the animal kingdom.

Earth (Bolar). See Bole.

Earth (Heavy). See Baryte.

Earth (Japan). See Catechu.

Earth (Mineral calcareous). Calcareous earths which are obtained from the mineral kingdom, as stalactites, spars, and marbles. The term is applied in opposition to those obtained from animals.

Earth nut. See Pig nut.

Earth (Sealed). *Terra sigillata.* Little cakes of bolar earths, which are stamped with impressions. They were formerly in high estimation as absorbents, but now fallen into disuse.

Earth, in sporting language: a fox beating his pursuers when hunted, and taking refuge under ground, is said to have earthed, or gone to earth. Some of these earths are situate in old chalk pits, forming such different channels and ramifications amidst the roots of trees in woods and coppices, that it is impossible to dig the animal out of them; but where there is the least probability of success, it is never relinquished; upon the principle, that the hounds are entitled to blood after a good chase.

EA'RTHBOARD. *s.* The board of the plough that shakes off the earth (*Mortimer*).

EA'RTHBORN. *a.* (*earth* and *born.*) 1. Born of the earth; terrigenous (*Prior*). 2. Meanly born (*Smith*).

EA'RTHBOUND. *a.* (*earth* and *bound.*) Fastened by the pressure of the earth (*Shakspeare*).

EA'RTHEN. *a.* (from *earth.*) Made of earth; made of clay (*Wilkins*).

Earthen-ware, for the process of making, see Pottery.

EA'RTHFLAX. *s.* (*earth* and *flax.*) A kind of fibrous fossil (*Woodward*).

EA'RTHINESS. *s.* The quality of containing earth; grossness.

EA'RTHLING. *s.* (from *earth.*) An inhabitant of the earth; a mortal; a poor frail creature (*Drummond*).

EA'RTHLY. *a.* (from *earth.*) 1. Not heavenly; mean; vile; sordid (*Milton*). 2. Belonging only to our present state; not spiritual (*Hooker*). 3. Corporeal; not mental (*Pope*).

EARTHQUAKE, in natural history, a vehement shake, or agitation of some considerable place or part of the earth, from natural causes, attended with a terrible noise like thunder, and frequently with an eruption of water or fire, or else of smoke or winds.

Earthquakes are the greatest and most formidable phænomena of nature. Aristotle and Pliny distinguish two kinds with respect to the manner of the shake, viz. a tremor and a pulse; the first being horizontal, in alternate vibrations, compared to the shaking of a person in an ague; the second perpendicular, up and down; which latter kind are also called by Aristotle, *βρασται*, from the resemblance of their motion to that of boiling.

Historians and philosophers relate numerous instances of the dreadful and various effects of earthquakes: from which we shall select only two. The first is the description of the earthquake at Calabria, in the year 1638: it happened whilst the celebrated father Kircher was on his journey to visit mount Ætna; and we shall present the account in his language.

"Having hired a boat (says he), in company with four more (two friars of the order of St. Francis, and two seculars), we launched from the harbour of Messina, in Sicily; and arrived, the same day, at the promontory of Pelorus. Our destination was for the city of Euphæmia, in Calabria; where we had some business to transact, and where we designed to tarry for some time. However, Providence seemed willing to cross our design; for we were obliged to continue three days at Pelorus, on account of the weather; and though we often put out to sea, yet we were as often driven back. At length, wearied with the delay, we resolved to prosecute our voyage; and, although the sea seemed more than usually agitated, we ventured forward. The gulph of Charybdis, which we approached, seemed whirled round in such a manner, as to form a vast hollow, verging to a point in the centre. Proceeding onward, and turning my eyes to Ætna, I saw it cast forth large volumes of smoke, of mountainous sizes, which entirely covered the island, and blotted out the very shores from my view. This, together with the dreadful noise, and the sulphurous stench which was strongly perceived, filled me with apprehensions, that some more dreadful calamity was impending. The sea itself seemed to wear a very unusual appearance: they who have seen a lake in a violent shower of rain, covered all over with bubbles, will conceive some idea of its agitations. My surprise was increased, by the calmness and serenity of the weather; not a breeze, not a cloud, which might be supposed to put all nature thus into motion. I therefore warned my companions, that an earthquake was approaching; and after some time, making for the shore with all possible diligence, we landed at Tropæa, happy and thankful for having escaped the threatening dangers of the sea.

"But our triumphs at land were of short duration; for we had scarcely arrived at the Jesuits' college, in that city, when our ears were stunned with a horrid sound resembling that of an infinite number of chariots, driven fiercely forward; the wheels rattling, and the thongs cracking. Soon after this, a most dreadful earthquake ensued; so that the whole tract upon which we stood seemed to vibrate, as if we were in the scale of a balance, that continued wavering. This motion, however, soon grew more violent; and being no longer able to keep my legs, I was thrown prostrate upon the ground. In the mean time, the universal ruin round me redoubled my amazement. The crash of falling houses, the tottering of towers, and the groans of the dying, all contributed to raise my terror and despair. On every side of me, I saw nothing but a scene of ruin; and danger threatening wherever I shou'd fly. I commended myself to God, as my last great refuge. At that hour, O how vain was every sublunary happiness! Wealth, honour, empire, wisdom, all mere useless sounds, and as empty as the bubbles in the deep! Just standing on the threshold of eternity, nothing but God was my pleasure; and the nearer I approached I only loved him the more. After some time, however, finding that I remained unhurt, amidst the general concussion, I resolved to venture for safety; and running as fast as I could, I reached the shore, but almost terrified out of my reason. I did not search long here, till I found the boat in which I had landed; and my companions also, whose terrors were even greater than mine. Our meeting was not of that kind, where every one is desirous of telling his own happy escape: it was all silence, and a gloomy dread of impending terrors.

"Leaving this seat of desolation, we prosecuted our voyage along the coast; and the next day came to Rochetta, where we landed, although the earth still continued in violent agitations. But we had scarcely arrived at our inn, when we were once more obliged to return to the boat; and, in about half an hour, we saw the greater part of the town, and the inn at which we had set up, dashed to the ground, and burying the inhabitants beneath the ruins.

"In this manner, proceeding onward in our little vessel, finding no safety at land, and yet, from the smallness of our boat, having but a very dangerous continuance at sea, we at length landed at Lopizium, a castle midway between Tropæa and Euphæmia, the city to which, as I said before, we were bound. Here, wherever I turned my eyes, nothing but scenes of ruin and horror appeared; towns and castles levelled to the ground; Strombalo, though at sixty miles distance, belching forth flames in an unusual manner, and with a noise which I could distinctly hear. But my attention was quickly turned from more remote to contiguous danger. The rumbling sound of an approaching earthquake, which we by this time were grown acquainted with, alarmed us for the consequence; it every moment seemed to grow louder, and to approach nearer. The place on which we stood now began to shake most dreadfully, so that being unable to stand, my companions and I caught hold of whatever shrub grew next to us, and supported ourselves in that manner.

"After some time, this violent paroxysm ceasing, we again stood up, in order to prosecute our voyage to Euphæmia, which lay within sight. In the mean time, while we were preparing for this purpose, I turned my eyes towards the city, but could see only a frightful dark cloud, that seemed to rest upon the place. This the more surprised us, as the weather was so very serene. We waited, therefore, till the cloud had passed away: then turning to look for the city, it was totally sunk. Wonderful to tell! nothing but a dismal and putrid lake was seen where it stood. We looked about to find some one that could tell us of its sad catastrophe, but could see no person. All was become a melancholy solitude; a scene of hideous desolation. Thus proceeding pensively along, in quest of some human being that could give us a little information, we at length saw a boy sitting by the shore, and appearing stupified with terror. Of him, therefore, we inquired concerning the fate of the city; but he could not be prevailed on to give us an answer. We entreated him, with every expression of tenderness and pity, to tell us; but his senses were quite wrapt up in the contemplation of the danger he had escaped. We offered him some victuals, but he seemed to loath the sight. We still persisted in our offices of kindness; but he only pointed to the place of the city, like one out of his senses; and then running up into the woods, was never heard of after. Such was the fate of the city of Euphæmia: and as we continued our melancholy course along the shore, the whole coast, for the space of two hundred miles, presented nothing but the remains of cities; and men scattered, without a habitation, over the fields. Proceeding thus along, we at length ended our distressful voyage, by arriving at Naples, after having escaped a thousand dangers both at sea and land."

The great and almost universal earthquake which happened on the 1st of November, 1755, affords a dreadful example of the chief attendants of these striking phænomena, on which account the reader shall be presented with the following description of it.

At Lisbon, in Portugal, its effects were most severe. In 1750, there had been a sensible trembling of the earth felt in that city: for four years afterwards, there had been an excessive drought; insomuch that some springs, formerly very plentiful of water, were dried and totally lost. The predominant winds were north and north-east, accompanied with various, though very small, tremors of the earth. The year 1755 proved very wet and rainy; the summer cooler than usual; and for forty days before the earthquake, the weather was clear, but not remarkably so. The last day of October, the sun was obscured, with a singular gloominess in the atmosphere. The 1st of November, early in the morning, a thick fog arose, which was soon dissipated by the heat of the sun; no wind was stirring; the sea was calm; and the weather as warm as in June or July in this country. At thirty-five minutes after nine, without the least warning, except a rumbling noise not unlike the artificial thunder in our theatres, a most dreadful earthquake shook, by short but quick vibrations, the foundations of all the city, so that many buildings instantly fell. Then, with a scarce perceptible pause, the nature of the motion was changed, and the houses were tossed from side to side, with a motion like that of a waggon violently driven over rough stones. This second shock laid almost the whole city in ruins, with prodigious slaughter of the people. The earthquake lasted in all about six minutes. At the moment of its beginning, some persons on the river, near a mile from the city, heard their boat make a noise as if it had run aground, though they were then in deep water; and at the same time they saw the houses falling on both sides of the river. The bed of the river Tagus was in many places raised to its surface. Ships were driven from their anchors, and jostled together with great violence; nor did their masters know whether they were afloat or aground. A large new quay sunk to an unfathomable depth, with several hundreds of people who were upon it; nor was one of the dead bodies ever found. The bar was at first seen dry from shore: but suddenly the sea came rolling in like a mountain; and about Belem castle the water rose fifty feet almost in an instant. About noon there was another shock; when the walls of several houses that yet remained were seen to open from top to bottom more than a quarter of a yard, and afterwards closed again so exactly that scarce any mark of the injury was left.

At Colares, about twenty miles from Lisbon, and two miles from the sea, on the last day of October, the weather was clear, and uncommonly warm for the season. About four o'clock in the afternoon there arose a fog, which came from the sea, and covered the valleys; a thing unusual at that season of the year. Soon after, the wind changing to the east, the fog returned to the sea, collecting itself, and becoming exceeding thick. As the fog retired, the sea rose with a prodigious roaring. The first of November, the day broke with a serene sky, the wind continuing at east; but about nine o'clock the sun began to grow dim; and about half an hour after was heard a rumbling noise like that of chariots, which increased to such a degree, that it became equal to the explosions of the largest cannon. Immediately a shock of an earthquake was felt, which was quickly succeeded by a second and third; and at the same time several light flames of fire issued from the mountains resembling the kindling of charcoal. In these three shocks, the walls of the buildings moved from east to west. In another situation, from whence the sea coast could be discovered, there issued from one of the hills called the Fojo, a great quantity of smoke, very thick, but not very black. This still increased with the fourth shock, and afterwards continued to issue in a greater or less degree. Just as the subterraneous rumblings were heard, the smoke was always observed to burst forth at the Fojo; and the quantity of smoke was always proportioned to the noise. On visiting the place from whence the smoke was seen to arise, no signs of fire could be perceived near it.

At Oporto (near the mouth of the river Douro) the earthquake began about forty minutes past nine. The sky was very serene; when a dreadful hollow noise like thunder, or the rattling of coaches at a distance, was heard, and almost at the same instant the earth began to shake. In the space of a minute or two, the river rose and fell five or six feet, and continued to do so for four hours. It ran up at first with so much violence, that it broke a ship's hawser. In some parts the river opened, and seemed to discharge vast quantities of air; and the agitation in the sea was so great about a league beyond the bar, that air was supposed to have been discharged there also.

St. Ube's, a sea-port town about twenty miles south of Lisbon, was entirely swallowed up by the repeated shocks and the vast surf of the sea. Huge pieces of rock were detached at the same time from the promontory at the west end of the town, which consists of a chain of mountains, containing fine jasper of different colours.

The same earthquake was felt all over Spain, except in Catalonia, Arragon, and Valencia. At Ayamonte (near where the Guadiana falls into the bay of Cadiz), a little before ten o'clock on the 1st of November, the earthquake was felt; having been immediately preceded by a hollow rushing noise. Here the shocks continued for fourteen or fifteen minutes, damaged almost all the buildings, throwing down some, and leaving others irreparably shattered. In little more than half an hour after, the sea and river, with all the canals, overflowed their banks with great violence, laying under water all the coasts of the islands adjacent to the city and its neighbourhood, and flowing into the very streets. The water came on in vast black mountains, white with foam at the top, and demolished more than one half of a tower at the bar named De Canala. In the adjacent strands every thing was irrecoverably lost; for all that was overflowed sunk, and the beach became a sea, without the least resemblance of what it was before. Many persons perished; for although they got aboard some vessels, yet part of these foundered; and others being forced out to sea, the unhappy passengers were so terrified, that they threw themselves overboard. The day was serene, and not a breath of wind stirring.

At Cadiz, some minutes after nine in the morning, the earthquake began, and lasted about five minutes. The water of the cisterns under ground washed backwards and forwards, so that a great froth arose. At ten minutes after eleven, a wave was seen coming from the sea, at eight miles distance, at least sixty feet higher than usual. It dashed against the west part of the town, which is very rocky. Though these rocks broke a great deal of its force, it at last came upon the city walls, beat in the breast-work, and carried pieces of the building of eight or ten ton weight to the distance of forty or fifty yards. When the wave was gone, some parts that are deep at low water, were left quite dry; for the water returned with the same violence with which it came. At half an hour after eleven came a second wave, and after that four other remarkable ones; the first at ten minutes before twelve; the second half an hour before one; the third ten minutes after one; and the fourth ten minutes before two. Similar waves, but smaller, and gradually lessening, continued with uncertain intervals till the evening.

At Gibraltar, the earthquake was not felt till after ten. It began with a tremulous motion of the earth, which lasted about half a minute. Then followed a violent shock; after that, a trembling of the earth for five or six seconds; then another shock was not so violent as the first, which gradually went off as it began. The whole lasted about two minutes. Some of the guns on the battery were seen to rise, others to sink, the earth having an undulating motion. Most people were seized with giddiness and sickness, and some fell down; others were stupefied; and many that were walking or riding felt no motion in the earth, but were sick. The sea rose six feet every fifteen minutes; and then fell so low, that boats and all the small craft near the shore were left aground, as were also numbers of small fish. The flux and reflux lasted till next morning, having decreased gradually from two in the afternoon. At Madrid, the earthquake came on the same time as at Gibraltar, and lasted about six minutes.

In Africa, the earthquake was felt almost as severely as it had been in Europe. Great part of the town of Algiers was destroyed. At Arzilla (a town in the kingdom of Fez), about ten in the morning, the sea suddenly rose with such impetuosity, that it lifted up a vessel in the bay, and dropped it with such force on the land, that it was broke to pieces; and a boat was found two musket-shots within land from the sea. At Fez and Mequinez, great numbers of houses fell down, and a multitude of people were buried in the ruins. At Morocco, by the falling down of a great number of houses, many people lost their lives: and at Salle, a great deal of damage also was done. At Tangier, the earthquake began at ten in the morning, and lasted ten or twelve minutes. At Tetuan, the earthquake began at the same time, but lasted only seven or eight minutes. There were three shocks so extremely violent, that it was feared the whole city would be destroyed.

In the city of Funchal, in the island of Madeira, a shock of this earthquake was first perceived at thirty-eight minutes past nine in the morning. It was preceded by a rumbling noise in the air, like that of empty carriages passing hastily over a stone pavement. The observer felt the floor immediately to move with a tremulous motion, vibrating very quickly. The shock continued more than a minute; during which interval, the vibrations, though continual, were weakened and increased in force twice very sensibly. The increase after the first remission of the shock was the most intense. The noise in the air accompanied the shock during the whole of its continuance, and lasted some seconds after the motion of the earth had ceased; dying away like a peal of distant thunder rolling through the air. At three quarters past eleven, the sea, which was quite calm, it being a fine day, and no wind stirring, retired suddenly some paces; then rising with a great swell without the least noise, and as suddenly advancing, overflowed the shore, and entered the city. It rose fifteen feet perpendicularly above the high-water mark, although the tide, which flows there seven feet, was then at half ebb. The water immediately receded; and after having fluctuated four or five times between high and low water-mark, it subsided, the sea remaining calm as before. In the northern part of the island the inundation was more violent, and the sea there retiring above one hundred paces at first, and suddenly returning, overflowed the shore, forcing open doors, breaking down the walls of several magazines and storehouses, leaving great quantities of fish ashore, and in the streets of the village of Machico. All this was the effect of one rising of the sea, for it never afterwards flowed high enough to reach the high-water mark. It continued, however, to fluctuate here much longer before it subsided than at Funchal; and in some places farther to the westward, it was hardly, if at all, perceptible.

These were the phænomena with which this remarkable earthquake was attended in those places where it was violent. The effects of it, however, reached to an immense distance; and were perceived chiefly by the agitations of the waters, or some slight motion of the earth. The utmost boundaries of this earthquake to the south are unknown; the barbarity of the African nations rendering it impossible to procure any intelligence from them, except where the effects were dreadful. On the north, however, we are assured, that it reached as far as Norway and Sweden. In the former, the waters of several rivers and lakes were violently agitated. In the latter, shocks were felt in several provinces, and all the rivers and lakes were strongly agitated, especially in Dalecarlia. The river Dala suddenly overflowed its banks, and as suddenly retired. At the same time a lake at the distance of a league from it, and which had no manner of communication with it, bubbled up with great violence. At Fahlun, a town in Dalecarlia, several strong shocks were felt.

In many places of Germany the effects of the earthquake were very perceptible; but in Holland, the agitations were still more remarkable. At Alphen on the Rhine, between Leyden and Woerden, in the afternoon of the first of November, the waters were agitated to such a violent degree, that buoys were broken from their chains, large vessels snapped their cables, smaller ones were thrown out of the water upon the land, and others lying on land were set afloat. At Amsterdam, about 11 in the forenoon, the air being perfectly calm, the waters were suddenly agitated in their canals, so that several boats broke loose; chandeliers were observed to vibrate in the churches; but no motion of the earth, or concussion of any building, was observed. At Haerlem, in the forenoon, for near four minutes together, not only the water in the rivers, canals, &c. but also all kinds of fluids in smaller quantities, as in coolers, tubs, backs,

&c. were surprisingly agitated, and dashed over the sides, though no motion was perceptible in the vessels themselves. In these small quantities also the fluid apparently ascended prior to its turbulent motion; and in many places, even the rivers and canals rose 12 inches perpendicularly.

The agitation of the waters was also perceived in various parts of Great Britain and Ireland. At Barlborough in Derbyshire, between 11 and 12 in the forenoon, in a boat-house, on the west side of a large body of water called Pibley Dam, supposed to cover at least thirty acres of land, was heard a surprising and terrible noise; a large swell of water came in a current from the south, and rose two feet on the sloped dam-head at the north end of the water. It then subsided; but returned again immediately, though with less violence. The water was thus agitated for three quarters of an hour; but the current grew every time weaker and weaker, till at last it entirely ceased.

At Busbridge in Surrey, at half an hour after 10 in the morning, the weather being remarkably still, without the least wind, in a canal near 700 feet long and 58 feet broad, with a small spring constantly running through it, a very unusual noise was heard at the east end, and the water there observed to be in great agitation. It raised itself in a heap or ridge in the middle; and this heap extended lengthwise about 30 yards, rising between two or three feet above the usual level. After this, the ridge heeled or vibrated towards the north side of the canal with great force, and flowed above eight feet over the grass walk on that side. On its return back into the canal, it again ridged in the middle, and then heeled with yet greater force to the south side, and flowed over its grass walk. During this latter motion, the bottom on the north side was left dry for several feet. This appearance lasted for about a quarter of an hour, after which the water became smooth and quiet as before. During the whole time, the sand at the bottom was thrown up and mixed with water; and there was a continual noise like that of water turning a mill. At Cobham in Surrey, Dunstall in Suffolk, Earsy Court in Berkshire, Eatonbridge in Kent, and many other places, the waters were variously agitated.

At Eyam-bridge, Derbyshire, (in the Peak) the overseer of the lead mines sitting in his writing-room about 11 o'clock, felt a sudden shock, which very sensibly raised him up in his chair, and caused several pieces of plaster to drop from the sides of the room. The roof was so violently shaken, that he imagined the engine shaft had been falling in. Upon this he immediately ran to see what was the matter, but found every thing in perfect safety. At this time two miners were employed in carting, or drawing along the drifts of the mines, the ore and other materials to be raised up at the shafts. The drift in which they were working was about 120 yards deep, and the space from one end to the other 50 yards or upwards. The miner at the end of the drift had just loaded his cart and was drawing it along; but he was suddenly surprised by a shock, which so terrified him, that he immediately quitted his employment, and ran to the west end of the drift to his partner, who was not less terrified than himself. They durst not attempt to climb the shaft, lest that should be running in upon them: but while they were consulting what means they should take for their safety, they were surprised by a second shock more violent than the first; which frightened them so much, that they both ran precipitately to the other end of the drift. They then went down to another miner who worked about 12 yards below them. He told them that the violence of the second shock had been so great, that it caused the rocks to grind one upon another. His account was interrupted by a third shock, which, after an interval of four or five minutes, was succeeded by a fourth; and, about the same space of time after, by a fifth; none of which were so violent as the second. They heard, after every shock, a loud rumbling in the bowels of the earth, which continued about half a minute, gradually decreasing, or seeming to remove to a greater distance.

At Shireburn castle, Oxfordshire, a little after ten in the morning, a very strange motion was observed in the water of a moat which encompasses the house. There was a pretty thick fog, not a breath of air, and the surface of the water all over the moat as smooth as a looking-glass, except at one corner, where it flowed into the shore, and retired again successively, in a surprising manner. In what manner it began to move is uncertain, as nobody observed the beginning of its motion. The flux and reflux, when seen, were quite regular. Every flood began gently; its velocity increased by degrees, when at last it rushed in with great impetuosity, till it had attained its full height. Having remained for a little time stationary, it then retired, ebbing gently at first, but afterwards sinking away with great swiftness. At every flux, the whole body of water seemed to be violently thrown against the bank; but neither during the time of the flux nor that of the reflux did there appear even the least wrinkle of a wave on the other parts of the moat. Lord Parker, who had observed this motion, being desirous to know whether it was universal over the moat, sent a person to the other corner of it, at the same time that he himself stood about 25 yards from him, to examine whether the water moved there or not. He could perceive no motion there, or hardly any: but another, who went to the north east-corner of the moat, diagonally opposite to his lordship, found it as considerable there as where he was. His lordship imagining, that in all probability the water at the corner diagonally opposite to where he was would sink as that by him rose, he ordered the person to signify by calling out, when the water by him began to sink, and when to rise. This he did; but, to his lordship's great surprise, immediately after the water began to rise at his own end, he heard his voice calling that it began to rise with him also; and in the same manner he heard that it was sinking at his end, soon after he perceived it to sink by himself. A pond just below was agitated in a similar manner; but the risings and sinkings of it happened at different times from those at the pond where lord Parker stood.

At White Rock in Glamorganshire, about two hours ebb of the tide, and near three quarters after six in the evening, a vast quantity of water rushed up with a prodigious noise; floated two large vessels, the least of them above 200 tons; broke their moorings, drove them across the river, and had like to have overset them. The whole rise and fall of this extraordinary body of water did not last above ten minutes, nor was it felt in any other part of the river, so that it seemed to have gushed out of the earth at that place.

Similar instances occurred at Loch Lomond and Loch Ness in Scotland. At Kinsale in Ireland,

and all along the coast to the westward, many similar phenomena were observed.

Shocks were also perceived in several parts of France; as at Bayonne, Bourdeaux, and Lyons; and commotions of the waters were observed at Angoulesme, Bleville, Havre de Grace, &c. but not attended with the remarkable circumstances above mentioned.

These are the most striking phenomena with which the earthquake of November 1, 1755, was attended on the surface of the earth. Those which happened below ground cannot be known but by the changes observed in springs, &c. which were in many places very remarkable.—At Colares, on the afternoon of the 31st of October, the water of a fountain was greatly decreased: on the morning of the first of November it ran very muddy; and after the earthquake, returned to its usual state both as to quantity and clearness. On the hills numbers of rocks were split; and there were several rents in the ground, but none considerable. In some places where formerly there had been no water, springs burst forth, which continued to run.—Some of the largest mountains in Portugal were impetuously shaken as it were from their foundation; most of them opened at their summits, split and rent in a wonderful manner, and huge masses of them were thrown down into the subjacent valleys.—From the rock called Pedra de Alvidar, near the hill Fojo, a kind of parapet was broken off, which was thrown up from its foundation in the sea.—At Varge, on the river Macaas, at the time of the earthquake, many springs of water burst forth, some spouted to the height of 18 or 20 feet, throwing up sand of various colours, which remained on the ground. A mountainous point, seven or eight leagues from St. Ube's, cleft asunder, and threw off several vast masses of rock.—In Barbary, a large hill was rent in two: the two halves fell different ways, and buried two large towns. In another place a mountain burst open, and a stream issued from it as red as blood. At Tangier, all the fountains were dried up, so that there was no water to be had till night.—A very remarkable change was observed on the medicinal waters of Toplitz, a village in Bohemia famous for its baths. These waters were discovered in the year 762; from which time the principal spring of them had constantly thrown out hot water in the same quantity, and of the same quality. On the morning of the earthquake, between 11 and 12 in the forenoon, the principal spring cast forth such a quantity of water, that in the space of half an hour all the baths ran over. About half an hour before this great increase of the water, the spring flowed turbid and muddy; then having stopped entirely for a minute, it broke forth again with prodigious violence, driving before it a considerable quantity of reddish ochre. After this it became clear, and flowed as pure as before. It still continues to do so; but the water is in greater quantity, and hotter, than before the earthquake. At Angoulesme in France, a subterraneous noise like thunder was heard; and presently after the earth opened, and discharged a torrent of water mixed with red sand. Most of the springs in the neighbourhood sunk in such a manner, that for some time they were thought to be quite dry. In Britain, no considerable alteration was observed in the earth, except that, near the lead mine above-mentioned in Derbyshire, a cleft was observed about a foot deep, six inches wide, and 150 yards in length.

At sea, the shocks of this earthquake were felt most violently. Off St. Lucar, the captain of the Nancy frigate felt his ship so violently shaken, that he thought she had struck the ground; but, on heaving the lead, found she was in a great depth of water. Captain Clarke from Denina, in N. lat. 36. 24. between nine and ten in the morning, had his ship shaken and strained as if she had struck upon a rock, so that the seams of the deck opened, and the compass was overturned in the binnacle. The master of a vessel bound to the American islands, being in N. lat. 25°, W. lon. 40°, and writing in his cabin, heard a violent noise, as he imagined, in the steerage; and while he was asking what the matter was, the ship was put into a strange agitation, and seemed as if she had been suddenly jerked up and suspended by a rope fastened to the mast-head. He immediately started up with great terror and astonishment; and looking out of the cabin window, saw land, as he took it to be, at the distance of about a mile. But, coming upon the deck, the land was no more to be seen, but he perceived a violent current cross the ship's way to the leeward. In about a minute, this current returned with great impetuosity, and at a league's distance he saw three craggy-pointed rocks throwing up waters of various colours resembling fire. This phenomenon, in about two minutes, ended in a black cloud, which ascended very heavily. After it had risen above the horizon, no rocks were to be seen; though the cloud still ascending, was long visible, the weather being extremely clear.—Between nine and ten in the morning, another ship, 40 leagues west of St. Vincent, was so strongly agitated, that the anchors, which were lashed, bounced up, and the men were thrown a foot and half perpendicularly up from the deck. Immediately after this, the ship sunk in the water as low as the main chains. The lead showed a great depth of water, and the line was tinged of a yellow colour, and smelt of sulphur. The shock lasted about ten minutes, but they felt smaller ones for the space of 24 hours.

Such were the phenomena of this very remarkable and destructive earthquake, which extended over a tract of at least four millions of square miles.

To explain the phenomena of earthquakes, various hypotheses have been invented. Till lately, those of modern philosophers were much the same with those of the ancients. Anaxagoras supposed the cause of earthquakes to be subterraneous clouds bursting out into lightning, which shook the vaults that confined them. Others imagined, that the arches, which had been weakened by continual subterraneous fires, at length fell in. Others derived these accidents from the rarefied steam of waters, heated by some neighbouring fires; and some, among whom was Epicurus, and several of the Peripatetic school, ascribed these terrible accidents to the ignition of certain inflammable exhalations.

This last hypothesis has been adopted by many of the most celebrated moderns, as Gassendus, Kircher, Schottus, Varenius, Des Cartes, Du Hamel, Honorius, Fabri, &c. The philosopher last mentioned indeed supposed, that waters prodigiously rarefied by heat might sometimes occasion earthquakes. The others supposed, as their hypothesis necessarily requires, that there are many and vast cavities under ground which have a communication with one another: some of which abound with waters; others with vapours and exhalations, arising from inflammable substances, as nitre, bitumen, sulphur, &c. These combustible exhalations they supposed to be kindled by a subterraneous spark, or by some active flame gliding through a narrow fissure from without, or by the fermentation of some mixture; and when this happened, they must necessarily produce pulses, tremors, and ruptures at the surface, according to the number and diversity of the cavities, and the quantity and activity of the inflammable matter. This hypothesis is illustrated by a variety of experiments, such as mixtures of iron-filings and brimstone buried in the earth, gunpowder confined in pits, &c. by all which a shaking of the earth will be produced.

Though none of these hypotheses were sufficient for explaining the phenomena of earthquakes in a satisfactory manner, one or other of them continued to be adopted by almost all philosophers till the year 1749. In the month of March in that year, an earthquake was felt at London and several other places in Britain. Dr. Stukeley, who had been much engaged in electrical experiments, began to suspect that phenomena of this kind ought to be attributed not to vapours or fermentations generated in the bowels of the earth, but to electricity. In a paper published by him on this subject he rejects all the above-mentioned hypotheses for reasons which appear to be very convincing and decisive; and on comparing all circumstances, he concludes, that an earthquake is a shock of the same kind as those which commonly occur in electrical experiments.

This hypothesis indeed is much confirmed by the phenomena attending earthquakes; particularly those of 1749 and 1750, which gave rise to his publication. The weather, for five or six months before, had been uncommonly warm; the wind south and south west, without rain; so that the earth must have been in a state peculiarly ready for an electrical shock. The flat county of Lincolnshire had been under an exceeding great drought. The uncommonness of the first of these circumstances, he remarks, is the reason why earthquakes are less frequently experienced in the northern than in the southern regions of the world, where the warmth and dryness of the air, so necessary to electricity, are more usual: And the latter shows how fit the dry surface was for an electrical vibration; and (which is of great importance) that earthquakes reach but little below the surface of the earth. Before the earthquake at London, all vegetables had been uncommonly forward; and electricity is well known to quicken vegetation. The aurora borealis had been frequent about that time, and just before the earthquake, had been twice repeated in such colours as had never been seen before. It had also removed southerly, contrary to what is common in England; so that the Italians, and those among whom earthquakes were frequent, actually foretold the earthquake. The year had been remarkable for fire-balls, lightning, and coruscations; and these are rightly judged to be meteors of an electrical nature. In these circumstances of the earth and air, nothing, he says, is wanting to produce an earthquake, but the touch of some non-electric body; which must necessarily be had *ab extra* from the region of the air or atmosphere. Hence he infers, that if a non-electric cloud discharge its contents upon any part of the earth, in that highly electrical state an earthquake must necessarily ensue. As the discharge from an excited tube produces a commotion in the human body, so the discharge of electric matter from the compass of many miles of solid earth must needs be an earthquake; and the snap from the contact, the horrid uncouth noise attending it. As to the manner in which the earth and atmosphere are put into this state, which prepares them to receive such a shock, and whence the electric matter comes, the doctor does not pretend to determine; but thinks it as difficult to be accounted for as magnetism, gravitation, and many other secrets of nature.

The same hypothesis was advanced by Signor Beccaria, without knowing any thing of Dr. Stukeley's discoveries. But this learned Italian imagined the electric matter which occasions earthquakes to be lodged deep in the bowels of the earth, agreeably to his hypothesis concerning lightning. Dr Priestley also, in his History of Electricity, contends for the agency of the electrical fluid in the production of earthquakes; and from the doctrines advanced by Stukeley and Beccaria frames a third hypothesis of his own.

All these, it is true, agree in the main; but if a particular solution of the phenomena is required, perhaps every one of them will be found deficient; nor shall we in this place, therefore, enter minutely into the arguments which each of these learned philosophers has brought in support of his opinion.

Besides the earthquakes above described, of which the cause seems to depend particular on a collection of electric matter in the bowels of the earth, there are others frequently felt in the neighbourhood of volcanos, which are plainly owing to the efforts of the burning matter to discharge itself. These however are but slight, and seldom extend to any considerable distance from the burning mountain. For a particular account of them, see the article VOLCANO.

EA'RTHSHAKING. *a.* (*earth* and *shake.*) Having power to shake the earth, or to raise earthquakes (*Milton*).

EARTH-STOPPER, in fox-hunting, a man whose department is to visit and stop the strongest earths in the district intended to be hunted on the following day. This is usually effected between the hours of ten at night and four in the morning, by means of bushes, brambles, earth, &c. to furnish which, he is provided with a hand-bill, spade, candle and lanthorn, a hardy rough poney, and terriers. It is also his business to re-open the earths after the sport of the day, that the foxes may not fall victims to other modes of destruction.

EA'RTHWORM. *s.* (*earth* and *worm.*) 1. A worm bred under ground (*Bacon*). 2. A mean sordid wretch (*Norris*).

EARTHWORM. Lumbricus terrestris. Vermis terrestris. These reptiles are supposed to possess a diuretic and antispasmodic virtue, with which views they are occasionally employed in foreign countries. See LUMBRICUS.

EA'RTHY. *a.* (from *earth.*) 1. Consisting of earth (*Wilkins*). 2. Partaking of earth; terrene (*Milton*). 3. Inhabiting the earth; terrestrial (*Dryden*). 4. Relating to earth (*Dryden*). 5. Not mental; gross; not refined (*Shakspeare*).

EASE. *s.* (*aise*, French.) 1. Quiet; rest; undisturbed tranquillity (*Davies*). 2. Freedom from pain (*Temple*). 3. Rest after labour; intermission of labour (*Swift*). 4. Facility; not difficulty (*Dryden*). 6. Unconstraint;

freedom from harshness, formality, or conceits (*Pope*).

To EASE. *v. a.* (from the noun.) 1. To free from pain (*Locke*). 2. To assuage; to mitigate (*Dryden*). 3. To relieve from labour, or any thing that offends (*Locke*).

EASEL, among painters, the frame on which the canvas is fixed, whereon portraits, landscapes, &c. are painted.

EASEL-PIECES, a denomination given by painters to such pieces as are contained in frames, in contradistinction from those painted on ceilings, &c.

EA'SEFUL. *a.* (*ease* and *full.*) Quiet; peaceable; fit for rest (*Shakspeare*).

EA'SEMENT. *s.* (from *ease.*) Assistance; support; relief from expences (*Swift*).

EASEMENT, in law, a privilege or convenience which one neighbour has of another, whether by charter or prescription, without profit; such are a way through his lands, a sink, or the like. These, in many cases, may be claimed.

EA'SILY. *ad.* (from *easy.*) 1. Without difficulty (*Prior*). 2. Without pain; without disturbance (*Temple*). 3. Reality; without reluctance (*Dryden*).

EA'SINESS. *s.* (from *easy.*) 1. Freedom from difficulty (*Tillotson*). 2. Flexibility; compliance; readiness (*Hooker*). 3. Freedom from constraint; not effort; not formality (*Roscom.*). Rest: tranquillity; ease (*Ray*).

EASING, in the sea language, signifies the slackening of a rope, or the like: thus, to ease the bow-line or sheet, is to let them go slacker; to ease the helm, is to let the ship go more large, more before the wind, or more larboard.

EAST, one of the four cardinal points of the world, being that point of the horizon where the sun is seen to rise when in the equinoctial. The word *east* is Saxon. It is frequently used to denote the regions of the world which lie easterly of Europe: as Tartary, China, &c.

EAST INDIES. See INDIA.

EAST INDIA COMPANY. See COMPANY.

EASTER, a festival of the Christian church, observed in memory of our Saviour's resurrection. The Greeks call it *pascha*, (πασχα) the Latins *pascha*, an Hebrew word (פסח) signifying passage, applied to the Jewish feast of the passover. It is called Easter in English, from the goddess Eostre, worshipped by the Saxons with peculiar ceremonies in the month of April. The Asiatic churches kept their Easter upon the very same day the Jews observed their passover, and others on the first Sunday after the first full moon in the new year. This controversy was determined in the council of Nice: when it was ordained that Easter should be kept upon one and the same day, which should always be a Sunday, in all Christian churches in the world; namely, the Sunday which falls upon or after the first full-moon after March 21st, or the vernal equinox.

In order to find Easter at any time, find the *epact* for the year proposed, and if it be less than 24 subtract it from 74; but if it be 24, it must be taken from 73; or if the epact be 24 and the golden number between 12 and 19, the epact must be taken from 73, and the remainder will be Easter limit, or the day of the paschal full moon. If the limit do not exceed 31, the day of the full moon will be in March; but if it exceeds 31, it will be in April; the Sunday after which full-moon will be Easter-day.

To find Easter according to the New or Gregorian Style, till the year 1900 exclusive.

Gold. Num.	Paschal full moon.	Sund. letter.
14	March 21	C
3	22	D
	23	E
11	24	F
	25	G
19	26	A
8	27	B
	28	C
16	29	D
5	30	E
	31	F
13	April 1	G
2	2	A
	3	B
10	4	C
	5	D
18	6	E
7	7	F
	8	G
15	9	A
4	10	B
	11	C
12	12	D
1	13	E
	14	F
9	15	G
	16	A
17	17	B
6	18	C

Look for the golden number of the year in the first column of the table, against which stands the day of the paschal full moon; then look in the third column for the Sunday letter, next after the day of the full moon, and the day of the month standing against that Sunday letter is Easter-day. When the full moon happens on a Sunday, then the next Sunday after is Easter-day.

For example: for the year 1790, the golden number is 5; against which stands March the 30th, and the next Sunday letter, which is C, below that, stands opposite April 4, which is therefore the Easter-day for the year 1790.

Though the Gregorian calendar be much preferable to the Julian, it is yet not without its defects. It cannot, for instance, keep the equinox fixed on the 21st of March, but it will sometimes fall on the 19th, and sometimes on on the 23d. Add, that the full moon happening the 20th of March, might sometimes be paschal; yet it is not allowed as such in the Gregorian computation; as, on the contrary, the full-moon of the 22d of March may be allowed for paschal, which it is not.

It may here be observed, that the paschal full-moons are, or ought to be, calculated for the longitude of Jerusalem; and that the days on which the full moons are reckoned, are astronomical days, ending at noon: on these accounts it was that, in 1798, Easter Sunday was kept on the 8th of April; whereas if the common mode of computation had been used, it would have fallen upon April 1st.

Easter Island, an island in the South sea, of a triangular form. It was visited by captain Cook in 1774; and is about 10 or 12 leagues in circuit, having an iron-bound shore: it affords neither safe anchorage, fresh-water, nor wood for firing. Lat. 27. 5 S. Lon. 109. 46 W.

EASTON, a town of Pennsylvania, capital of the county of Northampton. Lat. 40. 21 N. Lon. 75. 17 W.

EA'STERLY. *a.* (from *east.*) 1. Coming from the parts toward the east (*Raleigh*). 2. Lying toward the east (*Grant*). 3. Looking toward the east (*Arbuthnot*).

EA'STERN. *a.* (from *east.*) 1. Dwelling or found in the east; oriental (*Thomson*). 2. Lying or being toward the east (*Addison*). 3. Going toward the east (*Addison*). 4. Looking toward the east.

EA'STWARD. *ad.* (*east* and *toward.*) Toward the east (*Brown*).

EA'SY. *ad.* (from *ease.*) 1. Not difficult (*Hooker*). 2. Quiet; at rest; not harassed (*Smalridge*). 3. Free from pain (*Milton*). 4. Complying; unresisting; credulous (*Dryden*). 5. Ready; not unwilling (*Dryden*). 6. Free from want of more (*Swift*). 7. Not constrained; not formal (*Pope*).

To **EAT.** *v. a.* preterit *ate* or *eat*; part. *eat* or *eaten.* (etan, Saxon.) 1. To devour with the mouth (*Exodus*). 2. To consume; to corrode (*Tillotson*). 3. To swallow back; to retract (*Hakewill*).

To **Eat.** *v. n.* 1. To go to meals; to feed (*Matthew*). 2. To take food (*Locke*). 3. To be maintained in food (*Proverbs*). 4. To make way by corrosion (*South*).

EA'TABLE. *a.* (from *eat.*) That may be eaten.

Ea'table. *s.* Any thing that may be eaten (*King*).

EA'TER. *s.* (from *eat.*) 1. One that eats any thing (*Abbot*). 2. A corrosive.

EATH. *a.* (eað, Saxon.) Easy; not difficult (*Spenser*).

Eath. *ad.* Easily (*Spenser*).

EA'TINGHOUSE. *s.* (*eat* and *house.*) A house where provisions are sold ready dressed (*L'Estrange*).

EATON. See Eton.

Eaton's styptic, in medicine, French brandy highly impregnated with calcined green vitriol.

EAU-DE-LUCE. See Spiritus ammoniæ succinatus.

Eau-de-luce is prepared in the following manner: ten or twelve grains of white soap are dissolved in four ounces of rectified spirit of wine; after which the solution is strained. A dram of rectified oil of amber is then added, and the whole filtrated: with this solution should be mixed such a proportion of the strongest volatile spirit of sal-ammoniac, in a crystal glass bottle, as will, when sufficiently shaken, produce a beautiful milk-white liquor. If a kind of cream should settle on the surface, it will be requisite to add a small quantity of the spirituous solution of soap. Those who may wish to have this liquor perfumed may employ lavender or Hungary water instead of the spirit of wine.

This composition is, however, seldom obtained in a genuine state when purchased at the shops. Its use, as an external remedy, is very extensive; for it has not only been employed for curing the bites of vipers, wasps, bees, gnats, ants, and other insects, but also for burns, and even the bite of a mad dog, though not always with uniform success. Besides, it affords one of the safest stimulants in cases of suffocation from mephitic vapours, and in that state of apoplexy which is termed *serous*, as likewise after excessive intoxication, and in all those paralytic complaints where the vessels of the skin, or the muscular fibre, require to be excited into action. Nevertheless, it ought to be used with due precaution.

Mr. Nicholson, in his Journal, has related the following experiments, made to procure this liquid. He considers mastic as a principal ingredient, and the great secret by which the milkiness has been communicated to it.

One dram of the rectified oil of amber was dissolved in four ounces of the strongest ardent spirit of the shops; its specific gravity being ·840 at 60 degrees of Fahrenheit. A portion of the clear spirit was poured upon a larger quantity of fine powdered mastic than it was judged could be taken up. This was occasionally agitated without heat; by which means the gum resin was for the most part gradually dissolved. One part of the oily solution was poured into a phial, and to this was added one part of the solution of mastic. No opacity or other change appeared. Four parts of strong caustic volatile alkali was then poured in, and immediately shaken. The fluid was of a dense opake white colour, affording a slight ruddy tinge when the light was seen through a thin portion of it. In a second mixture, four parts of the alkali were added to one of the solution of mastic; it appeared of a less dense and more yellowish white than the former mixture. More of the gum resinous solution was then poured in; but it still appeared less opake than that mixture. It was ruddy by transmitted light. The last experiment was repeated with the oily solution instead of that of mastic. The white was much less dense than either of the foregoing compounds, and the requisite opacity was not given by augmenting the dose of the oily solution. No ruddiness nor other remarkable appearance was seen by transmitted light. These mixtures were left at repose for two days; no separation appeared in either of the compounds containing mastic; the compound consisting of the oily solution and alkali be.

came paler by the separation of a cream at the top.

It appears, therefore, that the first of these three mixtures, subject to variation of the quantity of its ingredients, and the odorant additions which may be made, is a good eau-de-luce.

In a subsequent number of the same journal, we have the following recipe by one of the author's correspondents, who had often proved its value by experience. "Digest ten or twelve grains of the whitest pieces of mastic, selected for this purpose, and powdered, in two ounces of alcohol; and when nearly dissolved, add twenty grains of elemi. When both the resins are dissolved, add ten or fifteen drops of rectified oil of amber, and fifteen or twenty of essence of bergamot: shake the whole well together, and let the fæces subside. The solution will be of a pale amber colour. It is to be added, in very small portions, to the best aqua ammoniæ puræ, until it assumes a milky whiteness, shaking the phial well after each addition, as directed by Macquer. The strength and causticity of the ammoniac are of most essential consequence. If upon the addition of the first drop or two of the tincture, a dense opake coagulated precipitate is formed, not much unlike that which appears on dropping a solution of silver into water slightly impregnated with common salt, it is too strong, and must be diluted with alcohol. A considerable proportion of the tincture, perhaps one to four, ought to be requisite to give the liquor the proper degree of opacity."

Eau-de-rabel. This is composed of one part of sulphureous acid to three of rectified spirit of wine. It is much used in France in the cure of gonorrhœas, leucorrhœa, &c.

EAVES. *s.* (eꝼeꞅe, Saxon.) The edges of the roof which overhang the house (*Woodward*).

To EA'VESDROP. *v. a.* (*eaves* and *drop.*) To catch what comes from the eaves; to listen under windows (*Shakspeare*).

EAVES-DROPPERS, such persons as stand under the eaves, or walls, and windows of an house, by night or day, to hearken after news, and carry it to others, and thereby cause strife and contention in the neighbourhood. They are called evil members of the commonwealth by the stat. of West. 1, c. 33. They may be punished either in the court-leet by way of presentment and fine, or in the quarter-sessions by indictment and binding to good behaviour.

EBB. *s.* (ebba, Saxon.) 1. The reflux of the tide toward the sea (*Addison*). 2. Decline; decay; waste (*Roscommon*).

To Ebb. *v. a.* (from the noun.) 1. To flow back toward the sea (*Shakspeare*). 2. To decline; to decay (*Halifax*).

EBDOME, in antiquity, a festival kept on the 7th of every lunar month, in honour of Apollo.

EBENUS, in botany, ebony-tree. See Amerimnum ebinus, and Ebony.

EBERBACH, a town of Germany, in the palatinate of the Rhine, remarkable for its wine. Lat. 49. 26 N. Lon. 8. 56 E.

EBION, the founder of a sect called after his name in the first century. He was a disciple of Cerinthus, and his successor. He improved upon the errors of his master, and engrafted upon them new opinions of his own. He began to preach in Judea, but taught in Asia, and even at Rome. It is imagined that St. John wrote his gospel with a view to the refutation of this heresy, and that of Cerinthus.

EBIONITES, in church history, heretics of the first century, so called from their leader Ebion. They held the same errors with the Nazarenes, united the ceremonies of the Mosaic institution with the precepts of the gospel, observed both the Jewish sabbath and Christian Sunday, and in celebrating the Eucharist, made use of unleavened bread. They abstained from the flesh of animals, and even from milk. In relation to Jesus Christ, some of them held that he was born, like other men, of Joseph and Mary, and acquired sanctification only by his good works. Others of them allowed that he was born of a virgin, but denied that he was the word of God, or had any existence before his human generation. They said, he was, indeed, the only true prophet; but yet a mere man, who by his virtue had arrived at being called Christ, and the son of God. They also supposed that Christ and the devil were two principles, which God had opposed to each other. Of the New Testament they only received the gospel of St. Matthew, which they called the gospel according to the Hebrews. See the article Nazarenes.

EBONY, a valuable wood, produced from a plant of which authors have given very different accounts, and concerning which they have been exceedingly undecided. The real tree, however, from which this wood is obtained, is the amerimnum ebenus of the West Indies; for the generic character of which, see Amerimnum. This wood is exceedingly hard and heavy, susceptible of a very fine polish, and hence often used for inlaid work and toys. The species affords several varieties, which yield a wood of different colours; chiefly, however, black, red, and green. The first is of most estimation: it is a tall tree, with dark coloured bark, and dark green, myrtiform leaves. Since the discovery of giving a fine black hue to other woods, ebony has been in far less frequent employment than formerly. Green ebony is the produce of a variety less lofty, and of a more bushy form, with smooth, bright, green leaves. This wood, like the preceding, is used as an inlay, and also affords a good green dye.

EBORACUM, in ancient geography, a famous city of the Brigantes in Britain; in the British language Caer-effroc, now York.

EBRA'CTEATE. In botany, raceme or peduncle is so called, when without any bracte or floral leaf; as in cistus guttatus.

EBRI'ETY. *s.* (*ebrietas*, Latin.) Drunkenness; intoxication by strong liquors (*Brown*).

EBRILLADE, in the manage, a check of the bridle which the horseman gives to the horse, by a jerk of one rein, when he refuses to turn. An ebrillade differs from a saccade; the latter being made with both reins at once, and the former with only one. Most people confound these two words under the general name of a check, or jerk of the bridle, called in French *coup de bride*. It is a chastisement, and no aid, and is disused in the schools.

EBRIO'SITY. *s.* (*ebriositas*, Lat.) Habitual drunkenness (*Brown*).

EBRIZIUS COLOR, in old writers, a fine yellow.

EBRO, a river of Spain, which rises in the mountains of Asturia, on the confines of Old Castile, and runs into the Mediterranean, a little below Tortosa, in Catalonia.

EBULLI'TION. *s.* (*ebullio*, Latin.) 1. The act of boiling up with heat. 2. Any intestine motion (*Bacon*).

Ebullition consists in the change which a fluid undergoes from a state of liquidity to that of an aeriform fluid or gas, in consequence of the application of heat, which dilates and converts it into vapour.

EBULUS. (*ebulus*, from *ebulio*, to make boil: so called, because of its use in purifying the humours of the body.) Dwarf elder, or danewort. The root, interior bark, leaves, flowers, berries, and seeds of this herbaceous plant, Sambucus ebulus; cymiestrifidis, stipulis foliaceis, caule herbaceo, of Linnéus, have all been administered medicinally, in moderate doses, as resolvents and deobstruents, and, in larger doses, as hydragogues. The plant is chiefly employed by the poor of this country, amongst whom it is in common use as a purgative.

ECA'LCARATE, in botany, a corol without any spur, or spur-shaped nectary. As in Wolfenia.

ECATÆA, in antiquity, statues erected to the goddess Hecate. The Athenians and Stratonicensians had an annual solemnity in honour of this goddess, which was called Ecatesia.

ECAVESSADE, in the manage, is used for a jerk of the cavesson.

ECBOLE, a term in the ancient Greek music, signifying a change in the enharmonic genus, by the accidental elevation of a chord, or string, five dieses above its ordinary pitch.

ECCE'NTRICAL. ECCE'NTRIC. *a.* (*eccentricus*, Latin.) 1. Deviating from the centre. 2. Not having the same centre with another circle (*Newton*). 3. Not terminating in the same point (*Bacon*). 4. Irregular; anomalous (*King Charles*).

ECCENTRI'CITY. *s.* (from *eccentric*.) 1. Deviation from a centre. 2. The state of having a different centre from another circle (*Holder*). 3. Excursion from the proper orb (*Wotton*).

ECCENTRICITY, in astronomy. See EXCENTRICITY.

ECCHYMA. (εκχυμα, from εκχυώ, to pour out.) In medicine, a fiery pustule, appearing suddenly all over the body.

ECCHYMO'MA. (*ecchymoma*, εκχυμωμα, an extravasation of blood.) Ecchymosis. Extravasation. Contusion. A black and blue swelling, either from a bruise or extravasation of blood. A genus of disease in the class locales, and order tumores of Cullen.

ECCHYMO'SIS. (*ecchymosis*, from εκχυω, to pour out.) See ECCHYMOMA.

ECCLAIRCI'SSEMENT. *s.* (Fr.) Explanation; the act of clearing up an affair by verbal expostulation (*Clarendon*).

ECCLESHALL, a town in Staffordshire, with a market on Friday. Lat. 53. 2 N. Lon. 2. 9 W.

ECCLESIASTES, one of the books of the Old Testament; thus called, by a Greek word, signifying preacher; because the author in it declaims, or preaches, against the vices and vanities of the world. This is Mariana's judgment: Grotius thinks otherwise; taking the book to derive its appellation from its being a collection of the fine sentences and reflections on the vanity of the things of our earth, &c. from the word קהל, which signifies to amass or collect, συναθροιζειν. Some Hebrew doctors, supposing the same etymon, will have it to have been thus called on account of its amassing a great deal of wisdom: others, because the author's aim is to assemble and call together all such as are willing to consult their safety, and avoid the dangers of the world, which is the opinion of Gejerus. Lastly, others, with Calovius, deduce it from his assembling them about him, as a preacher assembles his auditors.

There are different sentiments as to the author of this book: the most common is, that it is Solomon's, who is supposed to have wrote it towards the close of his life, to give tokens of his penitence to posterity

There appears no reason for denying this book to Solomon, but several for ascribing it to him. As 1. The title of the book, which asserts its author to be the son of David, and king of Jerusalem. 2. Several passages in the book, which agree to no body but that prince, as chap. i. ver. 12. chap. vii. ver. 25. chap. xii. ver. 9, &c. and, 3. The constant tradition of the ancient Jews and Christians.

ECCLESIA'STIC. *s.* A person dedicated to the ministries of religion (*Burnet*).

ECCLESIA'STICAL. ECCLESIA'STIC. *a.* (*ecclesiasticus*, Lat.) Relating to the church; not civil (*Hooker. Swift*).

ECCLESIASTICAL COURTS. In the time of the Anglo-Saxons, judge Blackstone observes, there was no sort of distinction between the lay and the ecclesiastical jurisdiction: the county-court was as much a spiritual as a temporal tribunal: the rights of the church were ascertained and asserted at the same time, and by the same judges, as the rights of the laity. For this purpose the bishop of the diocese, and the alderman, or in his absence the sheriff of the county, used to sit together in the county-court, and had there the cognizance of all causes as well ecclesiastical as civil; a superior deference being paid to the bishop's opinion in spiritual matters, and to that of the lay-judges in temporal. At length, by the artifices of the court of Rome, with whose views this rational and moderate plan was inconsistent, spiritual causes were prohibited from being tried in the secular courts. But king Henry I. at his accession, among other restorations of the laws of king Edward the Confessor, revived this of the union of the civil and ecclesiastical courts; which was, according to sir Edward Coke, only a restitution of the ancient law of England. This, however, was ill relished by the popish clergy, who, under the guidance of that arrogant prelate archbishop Anselm, very early disapproved of a measure that put them on a level with the profane laity, and subjected spiritual men and causes to the inspection of the secular magistrates: and, therefore, in their synod at Westminster, 3 Hen. I. they ordained, that no bishop should attend the discussion of temporal causes: which soon dissolved this newly effected union. And when, upon the death of king Henry I. the usurper Stephen was brought in and supported by the clergy, we find one article of the oath which they imposed upon him was, that ecclesiastical persons and ecclesiastical causes should be subject only to the bishop's jurisdiction. And as it was about that time that the contest and emulation began between the laws of England and those of Rome, the temporal courts adhering to the former, and the spiritual adopting the latter, as their rule of proceeding; this widened the breach between them, and made a coalition afterwards impracticable; which probably would else have been effected at the general reformation of the church.

Ecclesiastical courts are various; as the **ARCHDEACON'S**, the **CONSISTORY**, the Court of **ARCHES**, the **PECULIARS**, the **PREROGATIVE**, and the great court of appeal in all ecclesiastical causes, viz. the Court of **DELEGATES**. See those articles.

As to the method of proceeding in the spiritual courts, says Blackstone, it must in the first place be acknowledged to their honour, that though they continue to this day to decide many questions which are properly of temporal cognizance, yet justice is in general so ably and impartially administered in those tribunals (especially of the superior kind), and the boundaries of their power are now so well known and established, that no material inconvenience at present arises from this jurisdiction still continuing in the ancient channel. And, should any alteration be attempted, great confusion would probably arise, in overturning long established forms, and new-modelling a course of proceedings that has now prevailed for seven centuries.

The proceedings in the ecclesiastical courts are regulated according to the practice of the civil and canon laws; or rather to a mixture of both, corrected and new-modelled by their own particular usages, and the interposition of the court of common law. For, if the proceedings in the spiritual court be ever so regularly consonant to the rules of the Roman law, yet if they be manifestly repugnant to the fundamental maxims of the municipal laws, to which, upon principles of sound policy, the ecclesiastical process ought in every state to conform (as if they require two witnesses to prove a fact, where one will suffice at common law); in such cases, a prohibition will be awarded against them. But under these restrictions, the ordinary course of proceeding is, first, by citation, to call the party injuring before them. Then by libel (*libellus*, a little book), or by articles drawn out in a formal allegation, to set forth the complainant's ground of complaint. To this succeeds the defendant's answer upon oath; when, if he denies or extenuates the charge, they proceed to proofs by witnesses examined, and their depositions taken down in writing by an officer of the court. If the defendant has any circumstances to offer in his defence, he must also propound them in what is called his defensive allegation, to which he is intitled in his turn to the plaintiff's answer upon oath, and may from thence proceed to proofs as well as his antagonist. The canonical doctrine of purgation, whereby the parties were obliged to answer upon oath to any matter, however criminal, that might be objected against them (though long ago overruled in the court of chancery, the genius of the English law having broken through the bondage imposed on it by its clerical chancellors, and asserted the doctrines of judicial as well as civil liberty), continued till the middle of the last century to be upheld by the spiritual courts; when the legislature was obliged to interpose, to teach them a lesson of similar moderation. By the statute of 13 Car. II. c. 12. it is enacted, that it shall not be lawful for any bishop, or ecclesiastical judge, to tender or administer to any person whatsoever the oath usually called the oath *ex officio*, or any other oath whereby he may be compelled to confess, accuse, or purge himself of any criminal matter or thing, whereby he may be liable to any censure or punishment. When all the pleadings and proofs are concluded, they are referred to the consideration, not of a jury, but of a single judge; who takes information by hearing advocates on both sides, and thereupon forms his interlocutory decree or definitive sentence, at his own discretion: from which there generally lies an appeal, in the several stages mentioned in the articles above referred to; though if the same be not appealed from him in fifteen days, it is final, by the statute 25 Hen. VIII. c. 19.

ECCLESIASTICAL CORPORATIONS, are where the members that compose them are spiritual persons. They were erected for the furtherance of religion and perpetuating the rights of the church. See **CORPORATIONS**.

ECCLESIASTICUS, an apocryphal book, composed by Jesus the son of Sirach, and admitted by the Romish church into the canon of the Old Testament.

It is frequently cited by the abbreviation, *Eccli.* to distinguish it from the *Ecclesiastes* which is cited by *Eccle.*

Fa. Calmet takes the book of Ecclesiasticus to have been composed under the pontificate of Onias III. son of Simon, and the reign of Antiochus Epiphanes, king of Syria. He adds, that neither the author of the Latin translation, nor the time when it was made, is known; but being quoted regularly by all the ancient fathers, there is no doubt of its being very ancient. He takes it to have been done by the translator of the book of Wisdom.

ECCLISIS. (εκκλισις, from εκκλινω, to turn aside.) A luxation or dislocation.

ECCOPRO'TICS. (*eccoprotica, medicamenta*, εκκοπρωτικα; from εκ, and κοπρος, dung.) Opening medicines, whose operation is very gentle: such as manna, senna, &c.

ECCRINO'LOGY. (from εκκρινω, to secrete, and λογος, a discourse.) A treatise on the secretory system.

ECCRI'SIS, (from εκκρινω, to secrete.) A secretion of any kind.

ECDICI, in antiquity, patrons of cities.

ECDORA. (from εκδερω, to excoriate.) In medicine, *intertrigo*, or excoriation.

ECHAPE. In veterinary science, a horse got between a stallion of one breed or country and a mare of another.

ECHEIA, the harmonic vases used by the Greeks and Romans in their theatres, for the purpose of augmenting the sound of the voices of the actors. These vessels were tuned in the harmonical proportions of fourths, fifths, and eighths, with their replicates, and were placed in cells, or niches, between the seats of the spectators, (*Busby*).

ECHI'NEIS. In zoology, a genus of the class pisces, order thoracica. Head flat, naked, depressed; above flat; margined, and transversely streaked or grooved; gill membrane with ten rays; body naked. Three species; of which the one most worthy of note is e. remora, or sucking fish; with forked tail, and head with eighteen streaks acuminate on the fore-part; mouth large, lower jaw longer than the upper; teeth small, rough like a rasp; tongue broad, thin, loose, and, like the palate, beset with small teeth; eyes small, pupil large, iris silvery; vent near the tail; fins small, covered with a thick skin; tail semilunar. Inhabits the Mediterranean and Pacific Seas; from twelve to eighteen inches long: adheres so firmly to the sides of vessels and the larger fishes by its head, that it is often removed with great difficulty; and was by the ancients supposed to have a power of retarding or arresting a ship to which it thus adhered in the midst of its motion. Flesh not eaten. See Nat. Hist. Pl. LXXXVI.

ECHI'NATE. Echinated. In botany, an echinated pericarp. Beset with prickles like a hedgehog (εχινος.) As in datura stramonium. Prickly is the proper translation of *aculeatus*, and synonym of aculeate.

ECHINITES, in oryctology. See Helmintholitus.

ECHINO'PHORA. Sea Parsnip. Bristly Parsnip. In botany, a genus of the class pentandria, order digynia: involucel turbinate, one leafed, six-cleft; flowers of the margins, male pedicelled; the central one female; seeds immersed in the involucel. Two species.

1. E. spinosa: found on the sandy shores of England, with leaflets subulate-spinous, trifid or entire.

2. E. tenuifolia, with cut, unarmed leaves; and flowers in small umbels, with a short prickly involucre: found on the sea-coast of Apulia.

ECHINOPS. Globe-thistle. In botany, a genus of the class syngenesia, order polygamia segregata. Calyx many-leaved, reflected; calycle one-flowered; florets tubular, all hermaphrodite; receptacle bristly; seeds naked or downy. Six species; natives of the Levant or south of Europe. Some are annual, others perennial plants.

ECHINORY'NCHUS. In zoology, a genus of the class vermes, order intestina. Body round, proboscis cylindrical, retractile, and crowned with hooked prickles. These worms are generally found very firmly fixed to the viscera of various animals, generally the intestines; and often remain on the same spot during the whole life of the animal. They are mostly gregarious, and are easily distinguished from the tænia by their round inarticulate body. Forty-eight species, infesting mammals, birds, reptiles, and fishes. The longest and largest, e. gigas, is found in the intestines of swine, especially such as have been fattened in sties: it measures from a foot to a foot and a half in length. The rest vary from an inch to an inch and half, to eleven and twelve inches, according to the animal they infest.

ECHINUS. Sea-hedgehog. Sea-urchin. In zoology, a genus of the class vermes, order molusca. Body roundish, covered with a bony sutured crust, and generally furnished with moveable spines; mouth placed beneath, and mostly five valved. These worms are all of them inhabitants of the sea; and many of them have often been found in a fossile state; many are esculent; and they are generally armed with five sharp teeth; the pores are furnished with a retractile tentacle or feeler to each, by which the animal affixes itself to any object, and stops its motion. The spines are connected with the outer skin by very strong ligaments, and are the instruments of motion. A hundred and eight species, of which thirteen or fourteen have been found on our own coasts, or dug in a fossile state out of our own chalky or flinty soils; they may be thus subtribuated.

A. Vent vertical; tentacles every where simple.

B. Vent placed beneath; mouth without tentacles.

C. Vent lateral; mouth with pencilled tentacles.

The species most esteemed as an esculent, and thence denominated e. esculentus, is subglobular; with ten avenues of pores, the spaces between covered with small tubercles supporting the spines; body reddish or yellowish; spines short, of a vio[illegible] their colour and falling off the dead animal; pores in about three rows; tubercles surrounded with a *circle* of less ones: vent closed with a coriaceous membrane covered with spines. Inhabits the seas of Europe and India: and constituted the most savoury dish in the entertainments of Lentulus, when he was appointed priest of Mars.

The e. vulgaris, or common echinus, found perpetually in a fossile state, in numberless varieties of forms, is not now traced in a living state. In make it is orbicular; with ten avenues, two of them always near each other.

Echinus, in architecture, a member, or ornament, near the bottom of the Ionic, Corinthian, and Composite capitals; which, from its circular form or contour, is called by the English, quarter round, or *boultin*; and from its being usually carved, or cut with figures of eggs, &c. is called also by the Latins, *ovum*, by the Italians, *ovolo*, the French *œuf*, and the English *eggs* and *anchors*.

ECHI'TES. In botany, a genus of the class pentandria, order monogynia. Corol twisted, funnel-form, with the throat naked; follicles two, long, straight; seeds crowned with long down. Twenty-one species; chiefly natives of the West Indies and South America. One species, E. corymbosa, secretes a resinous juice, which has some resemblance to the caoutchouc or elastic gum; whence some naturalists have regarded e. corymbosa as the real caontchouc-tree, but this is an error: the true caoutchouc being obtained from the Siphonia elastica: which see.

E'CHIUM. Viper's Bugloss. In botany, a genus of the class pentandria, order monogynia. Corol irregular with the throat naked; stigma cloven. Twenty-seven species; chiefly Cape plants, but many from the east; and two, e. italicum, and e. vulgare, indigenous to the sandy hills or wastes of our own country. The last is said to be peculiarly grateful to bees; its stem is tubercled, bristly; stem-leaves lanceolate, bristly; spikes lateral with deflected hairs. Few quadrupeds appear fond of it, and some refuse it.

ECHO, or **Eccho**, a sound reflected or reverberated, from a solid concave body, and so repeated to the ear. The word is formed from the Greek ηχος, *sound*, which comes from the verb ηχεω, *sono*. The ancients being wholly unacquainted with the true cause of the echo, ascribed it to several causes sufficiently whimsical. The poets, who were not the worst of their philosophers, imagined it to be a person of that name metamorphosed, and that she affected to take up her abode in particular places; for they found, by experience, that she was not to be met with in all.

Almost all modern philosophers, till very lately, have ascribed the formation of echoes to a reflection of sound, similar to that experienced by light when it falls on a polished body; but, as D'Alembert observes, this explanation is false; if it were not, a polished surface would be necessary for the production of an echo; but it is well known that this is not the case. Echoes are frequently heard opposite to old walls, which are far from being polished; near shapeless masses of rock, and in the neighbourhood of forests, and even of clouds. This reflection of sound, therefore, is not of the same nature as that of light. It is evident, however, that the formation of an echo can be ascribed only to the repercussion of sound; for echoes are never heard, but when sound is intercepted and made to rebound by one or more obstacles.

To produce an echo, it should seem that a kind of concameration or vaulting were necessary, in order to collect, and by collecting to heighten and increase, and afterwards reflect, the sound; as we find is the case in reflecting the rays of light, where a concave mirror is required. In effect, as often as a sound strikes perpendicularly on a wall, behind which is any thing of a vault or arch, or even another parallel wall; so often will it be reverberated in the same line, or other adjacent ones. For an echo to be heard, therefore, it is necessary the ear be in the line of reflection: and for the person who made the sound to hear its echo, it is necessary he be perpendicular to the place which reflects it.

Sound, it is known, is propagated in every direction by the vibration of the particles of the air; but if any column of air rests against some obstacle that prevents the direct movement of the elastic globules, which serve as the vehicle of sound, it must rebound in a contrary direction, and striking the ear, if it meets with one in the line of repercussion, convey to it a repetition of the same sound, provided the original sound does not affect that organ at the same instant.

But we are taught by experience that the ear does not distinguish the succession of two sounds, unless there be between them the interval of at least one twelfth of a second; for during the most rapid movement of instrumental music, each measure of which cannot be estimated at less than a second, twelve notes are the utmost that can be comprehended in a measure, to render the succession of the sounds distinguishable; consequently the obstacle, which reflects the sound, must be at such a distance, that the reverberated sound shall not succeed the direct sound till after one twelfth of a second; and as sound moves at the rate of about 1142 feet in a second, and consequently about 95 feet in the twelfth of a second, it thence follows that, to render the reverberated sound distinguishable from the direct sound, the obstacle must be at the distance of no less than about 48 feet.

There are single and compound echoes. In the former, only one repetition of the sound is heard; in the latter, there are 2, 3, 4, 5, &c. repetitions. We are even told of echoes that can repeat the same word 40 or 50 times.

Single echoes are those where there is only one obstacle; but double, triple, or quadruple echoes, give us reason to suppose several obstacles disposed in such a manner, that the different reflected sounds strike the ear at times sensibly different.

Some echoes repeat several words in succession; but this is not astonishing, and must always be the case when a person is at such a distance from the echo, that there is sufficient time to pronounce several words before the repetition of the first has reached the ear.

Travellers and natural historians have furnished us with many accounts of echoes, which repeat words very often, or have some singularity. Misson, in his description of Italy, speaks of an echo in the vineyard of Simonetta, which repeated the same word 40 times. At Milan is an echo which reiterates the report of a pistol 56 times; and, if the report is very loud, upwards of 60 reiterations may be counted. The celebrated echo at Woodstock, in Oxfordshire, repeats the same sound 50 times. But the most singular echo we have yet heard of is one near Rosneath, a few miles from Glasgow. If a person placed at a proper distance from this echo plays 8 or 10 notes of a tune with a trumpet, they are faithfully repeated by the echo, but a third lower: after a short silence, another repetition is heard, in a tône still lower; and another short silence is followed by a third repetition in a tone a third lower. (*Despian's Amusements*).

Echoes have been applied to the purpose of measuring inaccessible distances. Thus, Dr. Derham, standing upon the banks of the Thames, opposite to Woolwich, observed that the echo of a single sound was reflected back from the houses in three seconds; consequently the sum of the direct and reflex rays must have been $1142 \times 3 = 3426$ feet, and the half of it, or 1713 feet, the breadth of the river in that place.

Echo, in architecture, a name given to such kinds of vaults and arches as are erected for the purpose of producing artificial echoes. For these, parabolic and elliptical figures are generally chosen.

Echo, in music, the repetition of some part of an air in a very low, soft, manner, in imitation of a real echo.

Echo, in poetry, a kind of composition wherein the last words or syllables of each verse contain some meaning, which being repeated apart, answers to some question or other matter contained in the verse, as in this beautiful one from Virgil:

> Crudelis mater magis, an puer improbus ille?
> Improbus ille puer, crudelis tu quoque mater.

The elegance of an echo consists in giving a new sense to the last words; which reverberate, as it were, the motions of the mind, and by that means affect it with surprise and admiration.

Echo, in fabulous history, a daughter of the Air and Tellus, who chiefly resided in the vicinity of the Cephisus. She was once one of Juno's attendants, and became the confidant of Jupiter's amours. Her loquacity, however, displeased Jupiter; and she was deprived of the power of speech by Juno, and only permitted to answer to the questions which were put to her. Pan had formerly been one of her admirers, but he never enjoyed her favours. Echo, after she had been punished by Juno, fell in love with Narcissus. (*Ovid*).

To **Echo.** *v. n.* 1. To resound; to give the repercussion of a voice (*Shakspeare*). 2. To be sounded back (*Blackmore*).

To **Echo.** *v. a.* To send back a voice; to return what has been uttered (*D. of Piety*).

ECHOMETRE. (from the Greek.) A graduated scale for measuring the duration of sounds, and determining the relations of their intervals.

ECKIUS (John), an eminent and learned divine, professor in the university of Ingoldstadt, memorable for the opposition he gave to Luther, Melancthon, Caralostadius, and other leading Protestants in Germany. He wrote many polemical tracts; and among the rest, a Manual of Controversies, printed in 1535, in which he discourses upon most of the heads contested between the Protestants and Papists. He was a man of uncommon learning, parts, and zeal, and died in 1543.

ECLA'MPSIS. (from εκλαμπτω, to shine.) The sparkling and flashing lights which strike the eyes of epileptic patients.

ECLA'T. *s.* (French.) Splendour; show; lustre (*Pope*).

ECLE'CTIC. *a.* (εκλεκτικος.) Selecting; choosing at will (*Watts*).

Eclectic, Eclectici, a name given to some ancient philosophers, who, without attaching themselves to any particular sect, took what they judged good, and solid, from each. Hence their denomination; which in the original Greek signifies, *that may be chosen*, or *that chooses*; of the verb εκλεγω, *I choose.*

Laertius notes, that they were also, for the same reason, denominated *analogetici*; but that they call themselves *Philalethes*, i. e. lovers of truth.

The chief, or founder, of the eclectici, was one Potamon, of Alexandria, who lived under Augustus and Tiberius; and who, weary of doubting of all things with the Sceptics and Pyrrhonians, formed the eclectic sect; which Vossius calls the eclective.

Towards the close of the second century a sect arose in the Christian church under the denomination of Eclectics, or modern Platonics. They professed to make truth the only object of their enquiry, and to be ready to adopt, from all the different systems and sects, such tenets as they thought agreeable to it. However, they preferred Plato to the other philosophers, and looked upon his opinions concerning God, the human soul, and things invisible, as conformable to the spirit and genius of the Christian doctrine. One of the principal patrons of this system was Ammonius Saccas, who at this time laid the foundation of that sect, afterwards distinguished by the name of the new Platonics, in the Alexandrian school. This philosopher [illegible] of Christian parents, and educated in the Christian faith, and probably never deserted the outward profession of this religion; though Porphyry maintains, in opposition to the testimony of Eusebius, that in maturer life he became a pagan; and Fabricius, who is followed by Dr. Lardner, alleges that there were two persons of the same name, the one a heathen philosopher, and the other a Christian writer. Those who are desirous of acquainting themselves with the grounds of these opposite opinions may consult Fabricius's Bibl. Græc. lib. iv. cap. 26. p. 159. Lardner's Collection of Jewish and Heathen Testimonies, vol. iii. p. 195, &c. and Mosheim, De Rebus Christianorum ante Const. Mag. p. 281, &c.

It was evidently the design of Ammonius to reconcile and unite all sects, philosophical and religious, and to inculcate a doctrine that should comprehend all, the Christians not excepted, in one common profession. For this purpose he maintained, that the great principles of all philosophical and religious truth were to be found, equally, in all sects; that they differed from each other only in their method of expressing them, and in some opinions of little or no importance; and that, by a proper interpretation of their respective sentiments, they might easily be united into one body. Accordingly, all the gentile religions, and even the Christian, were to be illustrated and explained by the principles of this universal philosophy; and the fables of the priests were to be removed from paganism, and the comments and interpretations of the disciples of Jesus from Christianity. In conformity to this plan he insisted, that all the religious systems of all nations should be restored to their original purity, and reduced to their primitive standard, viz. the ancient philosophy of the East, preserved uncorrupted by Plato; and he affirmed that this project was agreeable to the intentions of Jesus Christ, whose sole view, in descending upon earth, was to set bounds to the reigning superstition, to remove the errors that had blended themselves with the religions of all nations, but not to abolish the ancient theology from which they were derived. He therefore adopted the doctrines which were received in Egypt concerning the universe, and the Deity, considered as constituting one great whole, concerning the eternity of the world, the nature of souls, the empire of Providence, and the government of the world by dæmons. He also established a system of moral discipline, which allowed the people in general to live according to the laws of their country, and the dictates of nature, but required the wise to exalt their minds by contemplation. This system, so plausible in its first rise, but so comprehensive and complying in its progress, has been the source of innumerable errors and corruptions in the Christian church. At its first establishment it is said to have had the approbation of Athenagoras, Pantænus, and Clemens the Alexandrian, and of all who had the care of the public school belonging to the Christians at Alexandria, was afterwards adopted by Longinus, the celebrated author of the treatise on the Sublime, Plotinus, Herennius, Origen, Porphyry, Jamblichus the disciple of Porphyry, Sopater, Edisius, Eustathius, Maximus of Ephesus, Priscus, Chrysanthius the master of Julian, Julian the Apostate, Hierocles, Proclus, and many others, both pagans and Christians. Mosheim's Eccl. Hist. vol. i. p. 136, &c. &c. See PLATONISM.

ECLECTICS were also a certain set of physicians among the ancients, of whom Archigenes, under Trajan, was the chief, who selected from the opinions of all the other sects that which appeared to them best and most rational.

ECLE'GMA. *s.* (εκ and λειχειν.) A form of medicine made by the incorporation of oils with syrups (*Quincy*).

ECLIPSAREON, in astronomy, an instrument invented by Mr. Ferguson for exhibiting the time, progress, quantity, and duration of solar eclipses, at all parts of the earth. See Phil. Trans. vol. 48. p. 520; Ferguson's Astron. 8vo. p. 426.

ECLIPSE. (from εκλειψις, of εκλειπω, *deficio*, I fail.) In astronomy, a privation of the light of one of the luminaries, by the interposition of some opaque body, either between it and the eye, or between it and the sun.

The ancients had frightful ideas of eclipses; supposing them presages of the most dismal events. Plutarch assures us, that, at Rome, it was not allowed to talk publicly of any natural causes of eclipses. They made a great noise with brazen instruments, and raised loud shouts, during eclipses of the moon; as thinking, thereby, to ease her in labour: whence Juvenal, speaking of a talkative woman, says, "Una laboranti poterit succurrere lunæ." Others attributed the eclipse of the moon to the arts of magicians, who, by their enchantments, plucked her out of heaven, and made her skim over the grass. The natives of Mexico keep fast, during eclipses; and particularly their women, who beat and abuse themselves; drawing blood from their arms, &c. They imagine the moon has been wounded by the sun, in some quarrel between them.

The Hindus entertain strange ideas respecting the cause of an eclipse. They say that Rahoo, one of the asoors, stole a draught of the ameeta, at the churning of the ocean, and was discovered in the act by the sun and moon, who immediately revealed it to the soors. He was instantly cut in two by Narian: after which his head flew to the heavens, and continues to this day, endeavouring to eat the sun and the moon in revenge for telling of the theft. This causes the eclipse! When the eclipse begins, the people begin to shout and drum to frighten him away, lest he should swallow the luminary. In 1797, during an eclipse, one of Mr. Fountain's servants (the missionary) told him very seriously, he remembered when a boy, that Rahoo had swallowed the moon; but the people made such a great noise while he was getting the last bit into his mouth, that he was forced to let it go again. (Biblical Magazine, No. 8.)

The opinions of the Chinese with regard to eclipses are very similar to those of the Hindus, and had, probably, the same origin. A knowledge of the nature of eclipses, and of the superstitious notions entertained of them, was of considerable advantage to Christopher Columbus, when, in 1493, he was driven on the island of Jamaica, and distressed for want of provisions, was refused relief; but having threatened them with a plague, and foretelling an eclipse, as a token of it, which happened according to his prediction, the barbarians were so terrified, that they strove who should be the first in bringing supplies, throwing them at his feet, and imploring forgiveness.

Eclipses are divided, with respect to the objects eclipsed, into eclipses of the sun, of the moon, and of the satellites. And with respect to circumstances, into total, partial, annular, and central. A total eclipse, is one in which the whole disc of the luminary is darkened; a partial one, is when only a part of the disc is darkened; in an annular eclipse, the whole is darkened, except a ring or annulus, which appears round the dark part, like an illuminated border; and in a central eclipse, the centres of the two luminaries, and that of the earth, are in one and the same right line.

Every planet and satellite is illuminated by the sun; and casts a shadow towards that point of the heavens which is opposite to the sun. This shadow is nothing but a privation of light in the space hid from the sun by the opaque body that intercepts his rays.

When the sun's light is so intercepted by the moon, that to any place of the earth the sun appears partly or wholly covered, he is said to undergo an eclipse; though, properly speaking, it is only an eclipse of that part of the earth where the moon's shadow or penumbra falls. When the earth comes between the sun and moon, the moon falls into the earth's shadow; and having no light of her own, she suffers a real eclipse from the interception of the sun's rays. When the sun is eclipsed to us, the moon's inhabitants, on the side next the earth, see her shadow like a dark spot travelling over the earth, about twice as fast as its equatorial parts move, and the same way as they move. When the moon is in an eclipse, the sun appears eclipsed to her, total to all those parts on which the earth's shadow falls, and of as long continuance as they are in the shadow.

Lunar eclipses may be readily conceived after referring to fig. 6. Pl. 5. where S is the sun, E the earth, and M or M the moon: they only happen at the time of full moon; because it is only then the earth is between the sun and moon: nor do they happen every full moon, because of the obliquity of the moon's path with respect to the sun's; but only in such full moons as happen either at the intersection of those two paths, called the moon's nodes, or very near them; viz. when the moon's latitude, or distance between the centres of the earth and moon, is less than the sum of the apparent semi-diameters of the moon and the earth's shadow.

The chief circumstances in lunar eclipses are here mentioned: 1. All lunar eclipses are universal, or visible in all parts of the earth which have the moon above their horizon, and are every where of the same magnitude and duration. 2. In all lunar eclipses, the eastern side (or the left-hand side, as we look towards her from the north) is what first immerges into the shadow, and emerges again; for the proper motion of the moon being swifter than that of the earth's shadow, the moon approaches it from the west, overtakes and passes through it with the moon's east side foremost, leaving the shadow behind, or to the westward. 3. Although total eclipses of the longest duration happen in the node, yet there may be total eclipses within a small distance of the nodes, namely, within that distance where the moon's latitude is equal to the apparent semidiameter of the earth's shadow, minus the semidiameter of the moon's disc, but in these situations the duration of total darkness will be short; whereas in central eclipses it will continue nearly two hours. 4. If the earth had no atmosphere, the moon, when she was totally eclipsed, would be invisible; but as the earth has an atmosphere, some of the light from the sun will be refracted thereby, and transmitted to the moon, on which account the moon will be visible at that time, and appear of a dull red colour. Lastly, she grows sensibly paler and dimmer, before entering into the real shadow; owing to a penumbra which surrounds that shadow to some distance.

Astronomy of lunar eclipses, or the method of calculating their times, places, magnitudes, and other phenomena.—The first preliminary is to find the length of the earth's conical shadow. This may be found either from the distance between the earth and sun, and the proportion of their diameters, or from the angle of the sun's apparent magnitude at the time. Thus, suppose the semi-axis of the earth's orbit 95,000000 miles, and the eccentricity of the orbit 1,377000 miles, making the greatest distance 96,377000 miles, or 24194 semidiameters of the earth; and the sun's semidiameter being to to the earth's, as 112 to 1; then as AD : BE :: DB : EC, that is, 111 : 1 :: 24194 : 218 semidiameters of the earth = EC the length of the earth's shadow. Otherwise, suppose the angle AES, or the sun's apparent semidiameter be 15′ 56″, and the angle BAE, or the sun's parallax 8·6″, then is their difference, or the angle ACE = 15′ 47·4″; hence, as tang. 15′ 47·4″ : radius :: BE or 1 : 218 nearly = CE, the same distance as before. Hence, as the moon's least distance from the earth is scarce 56 semidiameters, and the greatest not more than 64, the moon, when in opposition to the sun, in or near the nodes, will fall into the earth's shadow, and will be eclipsed, as the length of the shadow is almost 4 times the moon's distance.

2. *To find the apparent semidiameter of the earth's shadow, in the place where the moon passes through it, at any given time.*—Add together the sun and moon's parallaxes, and from the sum subtract the apparent semidiameter of the sun; so shall the remainder be the apparent semidiameter of the shadow at the place of the moon's passage. For example, the 28th of April, 1790, at midnight, the moon's parallax is 61′ 9″, to which add 8·6″, or 9″, for the sun's parallax, from the sum 61′ 18″ take 15′ 56″, the sun's apparent semidiameter, and the remainder 45′ 22″ is the semidiameter of the shadow at the place where the moon passes through at that time. N. B. Some omit the sun's parallax, as of no consequence; but increase the apparent semidiameter of the shadow by one whole minute, for the shadow of the atmosphere; which would give the semidiameter of the shadow, in the case above, 46′ 13″.

3. There must also be had, the true distance of the moon from the node, at the mean opposition; also the true time of the opposition, with the true place of the sun and moon, reduced to the ecliptic; likewise the moon's true latitude at the time of the true opposition; the angle of the moon's way with the ecliptic, and the true horary motions of

the sun and moon: from which all the circumstances of her eclipse may be computed by common arithmetic and trigonometry.

To construct an eclipse of the moon.—Let EW (fig. 7. Pl. 5. part iv.) be a part of the ecliptic, and C the centre of the earth's shadow, through which draw perpendicular to EW, the line CN towards the north, if the moon have north latitude at the time of the eclipse, or CS southward, if she have south latitude. Make the angle NCD equal to the angle of the moon's way with the ecliptic, which may be always taken at 5° 35', on an average, without any sensible error; and bisect this angle by the right line CF; in which line it is that the true equal time of opposition of the sun and moon falls, as given by the tables.

From a convenient scale of equal parts, representing minutes of a degree, take the moon's latitude at the true time, and set it from C to G, on the line CF; and through the point G, at right angles to CD, draw the right line HKGLI for the path of the moon's centre. Then is L the point in the earth's shadow, where the moon's centre is at the middle of the eclipse; G the point where her centre is at the tabular time of her being full; and K the point where her centre is at the instant of her ecliptic opposition: also I the moon's centre at the moment of immersion, and H her centre at the end of the eclipse. With the moon's semidiameter as a radius, and the points I, L, H, as centres, describe circles for the moon at the beginning, middle, and end of the eclipse. Finally, the length of the line of path IH, measured on the same scale, will serve to determine the duration of the eclipse, viz. by saying, as the moon's horary motion from the sun is to IH : : 1 hour or 60 min. to the whole duration of the eclipse.

To compute a lunar eclipse.—This will be very easy from the foregoing construction. For, 1st, in the triangle CGL, right-angled at L, there are given the hypothenuse CG = the moon's latitude at the time of full moon, and the angle GCL = the half of 5° 35'; to find the legs CL and LG.—2d. In the right-angled triangle CHL or CIL, are given the leg CL, and CH or CI, the sum of the semidiameters of the moon and the earth's shadow; to find LH or LI, half the difference of the sun's and moon's motions during the time of the eclipse.—3d. As the difference of the horary motions of the luminaries is to one hour, or 60 min. : : HL to the semiduration of the eclipse, and : : GL to the difference between the opposition and middle of the eclipse; this last therefore taken from the time of full moon, gives the time of the middle of the eclipse; from which subtracting the time in LI, or semiduration before found, gives the beginning of the eclipse; or add the same, and it gives the end of it.—Lastly, from CO the semidiameter of the shadow, take CL, leaves LO; to which add LP, the moon's semidiameter, when necessary, gives OP the quantity eclipsed.

Note.—When the moon's distance from the node exceeds 12°, there can be no eclipse of the moon; or, more accurately, the limit is from $10\frac{1}{2}$ and $12\frac{1}{10}$ degrees, according to the distances of the sun, earth, and moon.

Solar eclipses may be understood, as to their nature and cause, by referring to fig. 8. Pl. 5, where S is the sun, M the moon, and CD the earth, *rmso* the moon's conical shadow, travelling over a part of the earth CoD, and making a complete eclipse to all the inhabitants residing in that track, but nowhere else; excepting that for a large space around it there is a fainter shade, included within all the space *r*CD*s*, which is called *penumbra*.

Solar eclipses happen only when the moon is in conjunction with the sun, that is at the new-moon, and also in the nodes, or near them, the limit being about 17° on each side a node: such eclipses only happening when the latitude of the moon, viewed from the earth, is less than the sum of the apparent semidiameters of the sun and moon. In the nodes, when the moon has no visible latitude, the occultation is total: with some continuance when the disk of the moon in perigee appears greater than that of the sun in apogee, and its shadow is extended beyond the surface of the earth: and total without continuance, when the point of the moon's shadow barely covers the earth. Lastly, out of the nodes, but within the limits, the eclipses are partial.

Other circumstances of solar eclipses are the following: 1. An eclipse of the sun does not appear the same in all parts of the earth where it is seen, but is in some total or annular, while in others it is partial. 2. A solar eclipse does not happen at the same time in all places where it is seen; but appears more early to the western parts, and more late to the eastern; as the motion of the moon beyond the sun, and consequently of her shadow, is from west to east. 3. An eclipse of the sun begins on the western side, and ends on the eastern. 4. No eclipse of the sun happens to all places where the sun is visible; for the penumbra does at no time cover a hemisphere of the earth. 5. The position of the cusps of the horns of the unobscured part of the sun's disc may be easily found in the middle of the eclipse; for the line which joins them is parallel to the moon's apparent way. 6. The middle of a solar eclipse will not be at the same time in all places on the same meridian; for the parallax of longitude will be different in different latitudes. 7. The excess of the apparent semidiameter of the moon above that of the sun in a total eclipse is so small, that total darkness seldom continues more than four minutes in the latitude of London. 8. In most solar eclipses the moon's disc is covered with a faint light, which is attributed to the reflection of the light from the illuminated part of the earth. 9. In total eclipses of the sun, the darkness is sometimes so great as to render visible the planets above the horizon, and stars of the second magnitude. In such eclipses the moon's limb is seen surrounded with a ring which appears much brighter and whiter near the moon's body than at a distance from it; this ring in all respects resembles the appearance of an enlightened atmosphere viewed from a distance; but whether it belongs to the moon or the sun is not entirely decided, though it is generally supposed that it belongs to the former.

The limits of a solar eclipse would be determined after the same manner as those of a lunar one, if the moon's parallax were insensible; but because the parallax is considerable, the method is rather altered. 1. Add together the apparent semidiameters of the luminaries, both in apogee and perigee; this gives 33' 16" for the greatest sum, and 30' 31" for the least. 2. Since the parallax diminishes the northern latitude, and augments the southern, let the greatest parallax in latitude be added to the former sums, and also subtracted from them; the sum or difference will in each case give the latitude beyond which there can be no eclipse; this latitude being given, the distance from the node is readily determined, and is found to be from $16\frac{1}{2}°$ to $18\frac{1}{2}°$, according to circumstances, for the limit, beyond which there can be no solar eclipse. Or, for this purpose M. Cassini gives the following directions: "Find the time of the mean conjunction, and at that time find the sun's mean longitude, also the longitude of the moon's node; and if the difference of these be less than 21°, there *may* be an eclipse; but if the difference be less than 15°, there *must* be one."

To calculate eclipses of the sun.—First, find the mean new moon, and thence the true one; with the place of the luminaries for the apparent time of the true one. 2. For the apparent time of the true new moon, compute the apparent time of the new moon observed. 3. For the apparent time of the new moon seen, compute the latitude seen. 4. Thence determine the digits eclipsed. 5. Find the times of the greatest darkness, immersion, and emersion. 6. Thence determine the beginning and ending of the eclipse.

To determine the duration of a solar eclipse.—Find the horary motion of the moon from the sun, for one hour before the conjunction, and another hour after; then say, as the former horary motion, to the seconds in an hour, so are the scruples of half duration (found as in a lunar eclipse) to the time of immersion; and as the latter horary motion, to the same seconds, so are the same scruples of half duration, to the time of emersion. Then, adding the times of immersion and emersion together, the aggregate is the total duration.

The moon's apparent diameter, when largest, exceeds the sun's when least, only 2′ of a degree; and at the greatest solar eclipse that can happen at any time and place, the total darkness cannot continue any longer than whilst the moon is moving through this 2′ from the sun in her orbit, which is about 4 minutes of time: for the motion of the shadow on the earth's disc is equal to the moon's motion from the sun, which on account of the earth's rotation on its axis towards the same way, or eastward, is about $30\frac{1}{2}$ minutes of a degree every hour, at a mean rate; but so much of the moon's orbit is equal to $30\frac{1}{2}$ degrees of a great circle on the earth, because the circumference of the moon's orbit is about 60 times that of the earth; and therefore the moon's shadow goes $30\frac{1}{2}$ degrees, or 1830 geographical miles in an hour, or $30\frac{1}{2}$ miles in a minute.

To determine the beginning, middle, and end, of a solar eclipse.—From the moon's latitude, for the time of conjunction, find the arch GL (fig. 7. Pl. 5.) or the distance of the greatest obscurity. Then say, as the horary motion of the moon from the sun, before the conjunction, is to 1 hour; so is the distance of the greatest darkness, to the interval of time between the greatest darkness and the conjunction. Subtract this interval, in the 1st and 3d quarter of the anomaly, from the time of the conjunction; and in the other quarters, add it to the same; the result is the time of the greatest darkness. Lastly, from the time of the greatest darkness subtract the time of incidence, and add it to the time of emersion; the difference in the first case will be the beginning; and the sum, in the latter case, the end of the eclipse.

To find the digits eclipsed.—Add the apparent semidiameters of the luminaries into one sum, from which subtract the moon's apparent latitude, the remainder shews the scruples, or parts of the diameter eclipsed. Then say, as the semidiameter of the sun, to the scruples eclipsed; so are 6 digits, or 360 scruples, to the digits, &c. eclipsed.

A very ingenious method of constructing and calculating solar eclipses was first given by Mr. Flamstead in vol. i. of sir Jonas Moore's System of Mathematics: the same method in substance is given by Dr. Keill, M. de la Caille, Mr. Ferguson, and Mr. Vince, in their respective treatises on Astronomy.

The following is a sketch of an analytical method for the computation of eclipses. We refer all the points which we have to consider, to three axes respectively perpendicular, according to the method adopted by the generality of modern mathematicians. We shall take for axes of the letters *y*, the line drawn from the centre of the earth to that of the luminary eclipsed, which we shall call in general *the planet*; for axes of the letters *x*, a line perpendicular to the former in the plane of the ecliptic; and for axes of the letters *z*, a third line perpendicular to both the others. The positive *y*, *y*, &c. will be directed towards the planet; the *x*, *x*, &c. positive to the left, according to the order of the signs; the *z*, *z*, &c. positive above the plane of the ecliptic, towards the boreal pole.

Following the example of Dionis du Séjour, we shall conceive a plane perpendicular to the axes of the *y*, *y*, &c. to pass through the centre of the moon; which we shall call the plane of projection; and upon it we shall determine the apparent place of the centre of the planet viewed from the place of the observer. This done, nothing will be more easy than to compute the apparent distance of the stars, which is the principal result of the calculus.

1. Call φ the longitude of the planet, ψ its latitude, φ' the longitude of the moon, ψ' its latitude, X, Y, Z, co-ordinates; taking for unity its distance from the earth, we shall easily obtain by a simple transformation of co-ordinates:

$$X=\sin(\varphi'-\varphi)\cos\psi'.$$
$$Y=\sin\psi\ \sin\psi+\cos\psi'\cos\psi\cos(\varphi'-\varphi).$$
$$Z=\sin\psi'\cos\psi-\cos\psi'\sin\psi\cos(\varphi'-\varphi).$$

It will appear as we proceed how we may pass to the value of Y. As to those of X and Z, we may at once give them this form:

$$X=\sin(\varphi'-\varphi)-2\sin(\varphi'=\varphi)\sin^2\tfrac{1}{2}\psi';$$
$$Z=\sin(\psi'-\psi)+2\sin^2\left(\frac{\varphi'-\varphi}{2}\right)\sin\psi\cos\psi':$$

which aproximate very nearly to the following values:

$$X=(\varphi'-\varphi)-2(\varphi'-\varphi)\sin^2\tfrac{1}{2}\psi$$
$$Z=(\psi'-\psi)+2\sin^2\left(\frac{\varphi'-\varphi}{2}\right)\sin\psi.$$

And as the terms of the second order will be always very small, they may be exhibited in little tables easy to compute: or, indeed table 95 at the end of vol. i. of Lalande's Astronomy will answer the purpose.

2. If we put ϱ for the radius of the earth passing through the place of the observer; α the angle which it makes with the plane of *xz*; β the angle which its projection on the same plane makes with the axis of Z; *x*, *y*, *z*, the co-ordinates of the place of the observer: we shall have, by known formulæ,

$$x=\varrho\cos\alpha\sin\beta$$
$$z=\varrho\cos\alpha\cos\beta$$
$$y=\varrho\sin\alpha;$$

and it is sufficiently obvious that, of the two angles α and β, the first expresses the altitude of the planet above the horizon; and the second, the parallactic angle formed by the vertical and the circle of latitude.

3. If we conceive a visual ray drawn from the eye of the observer to the centre of the planet, denoting by ξ and ζ the co-ordinates of the point where it cuts the plane of projection, respectively parallel to the axes of the x, x, &c. and of the z, z, &c., and by R the distance of the planet from the earth; we shall easily obtain

$$\xi=\frac{R-Y}{R-y}x,$$

$$\zeta=\frac{R-Y}{R-y}z.$$

But, representing by p the horizontal parallax of the moon, π that of the planet, we have, manifestly,

$$\varrho=p,$$
$$R=\frac{1}{\pi}:$$

substituting therefore these values, as well as those of x, y, and z; supposing also $Y=1$; and neglecting in the denominator the very minute term $\pi \sin \alpha$; we shall find

$$\xi=(p-\pi)\cos\alpha\sin\beta$$
$$\zeta=(p-\pi)\cos\alpha\cos\beta;$$

expressions extremely simple.

If, therefore, we call l the line which unites the centre of the moon, and the apparent place of the centre of the planet upon the plane of projection, we shall have,

$$l=\surd[(X-\xi)^2+(Z-\zeta)^2].$$

Now, this line may be considered perpendicular to the visual ray from the observer; while, on the other hand, the distance of this latter from the plane of projection is equal to $Y-y$. The apparent distance of the centres is, therefore, expressed by

$$\frac{l}{Y-y}.$$

Farther, let D be the horizontal semi-diameter of the moon; then $\frac{D}{Y-y}$ will be its semi-diameter augmented in the ratio of its altitude. Let, also, Δ be the semi-diameter of the planet; then will the sum of their apparent semi-diameters be

$$\frac{D}{Y-y}+\Delta.$$

Now, when this sum is equal to the apparent distance of the centres, the eclipse will be either at its commencement or at its end. We shall have, therefore, for each of those two instants:

$$\frac{l}{Y-y}=\frac{D}{Y-y}+\Delta;$$

or, by clearing the equation of fractions, supposing $Y=1$, and substituting for y its value, there results,

$$l=D+\Delta-p\Delta\sin\alpha.$$

But the term $p\Delta \sin \alpha$ can never exceed 15″. It may, therefore, be exhibited in a small table: and thus the whole is reduced, at length, to calculating the quantity L, which expresses the apparent distance of the centres, measured upon the plane of projection.

That the advantages of this method may the more easily be seen, we shall reduce it to a kind of epitome by which it may readily be compared with that given by M. Cagnoli, (at p. 423 of his Trigonometry) the best analytical method yet published.

Suppose that we wish to ascertain whether an eclipse has commenced at any given instant:

We find for that instant,

The longitude of the planet	φ
Its latitude	ψ
Its right-ascension	ϵ
Its declination	η
Its angle of position	θ
Its horizontal parallax	π
Its semi-diameter at the horizon	Δ
The longitude of the moon	φ'
Its latitude	ψ'
Its horizontal paralax	p
Its semidiameter at the horizon	D
The geocentric latitude of the place of the observer	λ
The right ascension of medium celi	m

Then make,

$$\text{Sin }\alpha=\sin\lambda\sin\eta+\cos\lambda\cos\eta\cos(m-\epsilon).$$

$$\text{Sin S}=\frac{\cos\lambda\ \sin(m-\epsilon)}{\cos\alpha}.$$

$$\beta=S-\theta.$$
$$\zeta=(p-\pi)\cos\alpha\cos\beta.$$
$$\xi=\zeta\tan\beta.$$
$$X=\varphi'-\varphi-2(\varphi'-\varphi)\sin^2\tfrac{1}{2}\psi'.$$
$$Z=\psi'-\psi+2\sin^2\tfrac{1}{2}(\varphi'-\varphi)\sin\psi.$$

(The terms of the second order vanish in eclipses of the sun; and in other cases may be exhibited in little tables.)

$$\text{Tan M}=\frac{Z-\zeta}{X-\xi}$$

$$l=\frac{X-\xi}{\cos M}.$$

Take the sum $D+\Delta$ of the horizontal semi-diameters: in solar eclipses subtract the small quantity $p\Delta \sin \alpha$, which may be shewn in a little table, the remainder compared with the value of L will shew if the eclipse is commenced.

The number of eclipses of both luminaries cannot be fewer than two, nor more than seven, in one year; the most usual number is four, and it is rare to have more than six. The reason is obvious; for the sun passes by both the nodes of the moon's orbit but once in a year, unless he pass by one of them in the beginning of the year, in which case he will pass by the same again a little before the end of the year; because the nodes retrograde about $19\frac{1}{3}$ degrees every year, and therefore the sun will come to either of them about 173 days after the other, for he will have to move $180°-\frac{19\frac{1}{3}°}{2}$, which will occupy nearly 173 days. And if neither node be within 17° of the sun at the time of new moon, the sun will be eclipsed; and at the subsequent opposition, the moon will be eclipsed in the other node, and come round to the next conjunction before the former node be 17° beyond the sun, and eclipse him again. When three eclipses happen about either node, the like number commonly happens about the opposite one; as the sun comes to it in 173 days afterwards, and 6 lunations contain only 4 days more. Thus there may be two eclipses of the sun, and one of the moon, about each of the nodes. But when the moon changes in either of the nodes, she cannot be near enough the other node at the next full, to be eclipsed; and in 6 lunar months afterwards she will change near the other node; in which case there cannot be more than two eclipses in a year, both of the sun. Speaking generally, there will be more solar than lunar eclipses, as they will nearly bear the proportion of their limits, viz. about 4 to 3. But more lunar than solar eclipses are seen at any given place; because a lunar eclipse is visible on a whole terrestrial hemisphere at once, whereas a solar eclipse is visible only on a portion of a hemisphere.

Period of eclipses, is the space of time after which the same eclipses return again. The moon's nodes move backwards $19\frac{1}{3}°$ every year, therefore they would shift through all the points of the ecliptic in eighteen years and 225 days; and this would be the regular period of the return of eclipses, if any complete number of lunations were performed in it, without a fraction; but this is not the case. However, in 223 mean lunations, after the sun, moon, and nodes, have been once in a line of conjunction, they return so nearly to the same state again, that the same node which was in conjunction with the sun and moon at the beginning of these lunations will be within 28′ 12″ of the line of conjunction, when the last of these lunations is completed; and in this period there will be a regular return of eclipses, till it be repeated about forty times, or in about 720 years, when the line of the nodes will be 28′ × 40 from the conjunction, and will, consequently, be beyond the ecliptic limits: this is called the Plinian period or Chaldean saros; it contains, according to Dr. Halley, 18 Julian years 11 days 7 hours 43 minutes 20 seconds; or, according to Mr. Ferguson, $18^{y}\ 11^{d}$ [illegible] $42^{m}\ 44^{s}$. In an interval of $557^{y}\ 21^{d}\ 18^{h}\ 11^{m}\ 51^{s}$, in which there are exactly 6890 mean lunations, the conjunction or opposition coincides so nearly with the node, as not to be distant more than 11″. If, therefore, to the mean time of any solar or lunar eclipse, we add this period, and make the proper allowance for the intercalary days, we shall have the mean time of the return of the same eclipse. This period is so very near, that in 6000 years it will vary no more from the truth, as to the restitution of eclipses, than $8\frac{1}{4}$ minutes of a degree.

The use of eclipses.—In astronomy, eclipses of the moon determine the spherical figure of the earth; they also shew that the sun is larger than the earth, and the earth than the moon. Eclipses also, that are similar in all circumstances, and that happen at considerable intervals of time, serve to ascertain the period of the moon's motion. In geography, eclipses discover the longitude of different places; for which purpose those of the moon are the more useful, because they are more often visible, and the same lunar eclipse is of equal magnitude and duration at all places where it is seen. In chronology, both solar and lunar eclipses serve to determine exactly the time of any past event.

Eclipses of the Satellites. See SATELLITES OF JUPITER.

To **ECLIPSE.** *v. a.* (from the noun.) 1. To darken a luminary (*Creech*). 2. To extinguish; to put out (*Shakspeare*). 3. To cloud; to obscure (*Calamy*). 4. To disgrace (*Clarendon*).

ECLIPTA, in botany, a genus of the class syngenesia, order polygamia superflua. Receptacle chaffy; downless; florets of the centre five-cleft. There are seven species; natives of the East or West Indies: and perhaps one or two indigenous to our own country.

ECLIPTIC. *a.* Something belonging to eclipses; as ecliptic limits, the greatest distances from the nodes at which the sun or moon can be eclipsed. This limit for lunar eclipses is between $10\frac{1}{2}$ and $12\frac{1}{30}°$; and, for solar eclipses, between $16\frac{1}{2}$ and $18\frac{1}{3}$; as stated in some of the preceding articles.

ECLIPTIC. *s.* In astronomy, a great circle of the sphere, supposed to be drawn through the middle of the zodiac. It is sometimes called the *via solis*, or sun's path, being the track which he appears to describe among the fixed stars; though, more properly, it is the apparent path of the earth, as viewed from the sun, and thence called the heliocentric circle of the earth. It obtained the name ecliptic, because all eclipses of the sun and moon happen when the moon is in or near a node where her path intersects this circle.

Upon the ecliptic are marked and counted the twelve celestial signs, Aries, Taurus, &c. and upon it the longitudes of planets and stars are reckoned. It is situated obliquely with respect to the equator, and cuts it in two points, viz. the beginning of Aries and Libra, which are directly opposite to each other; and, accordingly, we find the sun twice every year in the equator; and all the rest of the year, either on the north or south side thereof. The ecliptic is a great circle of the sphere, bisected by the horizon; consequently, the arch of the ecliptic, intercepted between the horizon and the meridian, is a quadrant. And again, the solstitial points of the ecliptic, i. e. those most remote from the equator, are a quadrant distant from the equinoctial points.

Obliquity of the Ecliptic, is the angle which it makes with the equator at their intersection. This obliquity may be found in the following manner: about the time of the summer solstice observe the sun's meridian altitude with the utmost care, for several days successively: from the greatest altitude observed, subtract the height of the equator; and the remainder is the greatest declination, which is the solstitial point. Or, it may be found by observing the meridian altitude of the sun's centre on the days of the summer and winter solstice; the difference of those altitudes will be the distance of the tropics; and half that distance will be the obliquity of the ecliptic.

This obliquity is now about 23° 27′ 58″; but it is variable. According to the observations of Pytheas, at Marseilles, made rather more than 300 years before the Christian æra, the obliquity was then $23° 49\frac{1}{3}′$. Albategnius, about the year 880, found it to be 23° 35′, or, by correcting for parallax and refraction, 23° 35′ 40″. Almæon, the son of Almansor the Arabian, made it 23° 33′ 30″ in 1140. Tycho Brahe, in 1587, found it to be 23° 29′ 30″. Mr. Flamsteed, in 1689, 23° 28′ 56″. Condamine, at Quito, in 1736, made it 23° 28′ 24″. Dr. Maskelyne, in 1769, determined it at 23° 28′ 10″. By a comparison with the most early and accurate observations, it appears that the diminution of the obliquity, is on the average about the rate of 50″ in a century, or half a second in a year.

This change in the obliquity of the ecliptic is wholly owing to the actions of the planets, and particularly Venus and Jupiter, upon the earth. According to La Grange, whose theory is admirable, the annual change of obliquity is variable, and has its limits. About 2000 years ago, he thinks it was at the rate of 38″ in 100 years; that it is now, and will be for 400 years to come, 56″ per century; but 2000 years hence, 49″ per century. After a very long period, the change of obliquity will vary from a diminution to an increase: and thus the obliquity of the ecliptic will vary alternately from greater to less, and from less to greater; the variations never exceeding 2°; as already observed in the *History of Astronomy*.

Ecliptic, in geography, an imaginary great circle on the terrestrial globe, not only answering to, but falling upon, the plane of the celestial ecliptic.

Poles of the Ecliptic, are the two opposite points of the sphere, which are each everywhere equally distant from the ecliptic quite around, or 90° distant from it. The distance of the poles of the ecliptic from the poles of the equator, or of the world, is always equal to the varying distance of the obliquity of the ecliptic.

ECLOGUE, in poetry, a small elegant composition in a simple natural style. The word takes its derivation from the Greek εκλογη, choice, so that, according to the etymology, an eclogue should be a choice or select piece.

The eclogue, in its primary intention, is the same thing with the idyllium; but custom has likewise made some difference between them, and appropriated the name eclogue to pieces wherein shepherds are introduced; and idyllium to those written like eclogues, but without shepherds in them. The eclogue is properly an image of the pastoral life; therefore the matter is low, and its genius humble. Its business is to describe the loves, sports, piques, jealousies, intrigues, and other adventures of shepherds; so that its character must be simple, the wit easy, the narration short; the thoughts ingenious, the manners innocent, the language pure; the verse flowing, the expressions plain, and all the discourse natural. The models in this sort of poetry are Theocritus and Virgil, who both have some eclogues of a lofty character: the eclogue, therefore, occasionally raises its voice. Yet M. Fontenelle esteems it a fault in some modern poets to have put matter of high concern in their eclogues, and made their shepherds sing the praises of kings and heroes.

E'CLYSIS. (εκλυσις, dissolution.) A dissolution or universal faintness.

ECONO'MICAL. Econo'mick. *a.* (from *economy.*) 1. Pertaining to the regulation of a household (*Davies*). 2. Frugal (*Wotton*).

ECO'NOMY. *s.* (οικονομια.) 1. The management of a family (*Taylor*). 2. Distribution of expence (*Dryden*). 3. Frugality; discretion of expence (*Swift*). 4. Disposition of things; regulation (*Hammond*). 5. The disposition or arrangement of any work (*Ben Jonson*). 6. System of matter; distribution of every thing to its proper place (*Blackmore*).

Economy (Political). See **Political.**

ECMARTYRIA, in antiquity, a kind of second-hand evidence admitted in the Athenian courts.

ECOUTE, in the manage, a pace or motion of a horse, when he rides well upon the hand and the heels, is compactly put upon his haunches, and bears or listens to the heels or spurs; and continues duly balanced between the heels, without throwing to either side. This takes place when a horse has a fine sense of the aids of the hand and heel.

ECPHORA, in architecture, the projecture, or the right line intercepted between the axis and the outermost surface of a member or moulding.

ECPHRA'CTICS. (from εκφρατσω, to remove obstructions.) Deobstruents; medicines which remove obstructions.

ECPY'CTICS. (from εκπυκαζω, to condense.) Incrassants: medicines that render the fluids more solid.

E'CSTACY. *s.* (εκςασις.) 1. Any passion in which the thoughts are absorbed, and in which the mind is for a time lost (*Suckling*). 2. Excessive joy; rapture (*Prior*). 3. Enthusiasm; excessive elevation and absorption of the mind (*Milton*). 4. Excessive grief or anxiety: not in use. 5. Madness; distraction: not in use (*Shakspeare*).

E'CSTASIED. *a.* (from *ecstacy.*) Ravished; filled with enthusiasm.

ECSTASIS. (from εξιστημι, to be delirious.) An ecstacy, delirium, or trance.

ECSTA'TIC. Ecsta'tical. *a.* (εκςαλικος.) I, Ravished; rapturous; elevated beyond the usual bounds of nature (*Stillingfleet*). 2. Raised to the highest degree of joy (*Pope*). 3. Tending to external objects (*Norris*).

ECSTATICI, in Grecian antiquity, a sort of diviners, who were cast into trances or ecstacies, in which they lay like dead men, or persons asleep, deprived of all sense or motion, but after some time, returning to themselves, they gave strange relations of what they had seen and heard.

ECTHESIS, in church history, a confession of faith, in the form of an edict, published in the year 639, by the emperor Heraclius, with a view to pacify the troubles occasioned by the Eutychian heresy in the eastern church. The same prince revoked it, on being informed that pope Severinus had condemned it, as favouring the Monothelites; declaring at the same time that Sergius, patriarch of Constantinople, was the author of it.

ECTHLIPSIS, among Latin grammarians, a figure of prosody, whereby the *m* at the end of a word, when the following word begins with a vowel, is elided, or cut off, together with the vowel preceding it, for the sake of the measure of the verse; thus they read *mult' ille*, for *multum ille*.

ECTO'PIÆ. (*ectopia*, εκτοπια, from εκτοπος, out of place.) Parts displaced. It constitutes an order in the class locales of Cullen's nosology.

ECTRO'PIUM. (*ectropium*, εκτροπιον, from εκτρεπω, to invert.) An extraversion of an eyelid, so that its internal surface is outermost.

ECTYPE, among antiquarians, an impression of a medal, seal, or ring, or a figured copy of an inscription, or other ancient monument.

ECU, or Escu, a Spanish crown. See Money.

ECYA, an episcopal town of Spain, in Andalusia. It contains twenty convents, and about 9000 inhabitants. Lat. 37. 39 N. Lon. 4. 27 W.

ECZE'MIA. Ecze'sma. (from εκζεω, to boil.) Heat eruptions: spring flushes: æstus volatilis, or feu-volant. It is a term that has been hitherto used by medical writers rather generally, to express every kind of cutaneous heat eruption, than restricted to any particular species.

EDA'CIOUS. *a.* (*edacitas*, Lat.) Eating; voracious; ravenous; greedy.

EDA'CITY. *s.* (*edacitas*, Lat.) Voracity; ravenousness; greediness; rapacity (*Bacon*).

EDDA, in antiquities, is a system of the ancient Icelandic, or Runic mythology, containing many curious particulars of the theology, philosophy, and manners, of the northern nations of Europe; or of the Scandinavians, who had migrated from Asia, and from whom our Saxon ancestors were descended. Mr. Mallet apprehends that it was originally compiled, soon after the Pagan religion was abolished, as a course of poetical lectures, for the use of such young Icelanders as devoted themselves to the profession of a scald or poet. It consists of two principal parts; the first containing a brief system of mythology, properly called the Edda; and the second being a kind of art of poetry, and called Scalda, or Poetics. The most ancient Edda was compiled by Soemund Sigfusson, surnamed the Learned, who was born in Iceland about the year 1057. This was abridged, and rendered more easy and intelligible, about a hundred and twenty years afterwards, by Snorro Sturleson, who was supreme judge of Iceland in the years 1215 and 1222; and it was published in the form of a dialogue. He added also the second part in the form of a dialogue, being a detail of different events transacted among the divinities. The only three pieces that are known to remain of the more ancient Edda of Soemund, are the Voluspa, the Havamaal, and the Runic chapter.

The first edition of the Edda was published by Resenius, professor at Copenhagen, in a large quarto volume, in the year 1665; containing the text of the Edda, a Latin translation by an Icelandic priest, a Danish version, and various readings from different MSS. Mr. Mallet has also given an English translation of the first part, accompanied with remarks; from which we learn, that the Edda teaches the doctrine of the Supreme, called the Universal Father, and Odin, who lives for ever, governs all his kingdom, and directs the great things as well as the small; who formed the heaven, earth, and air; made man, and gave him a spirit or soul, which shall live after the body shall have mouldered away; and then all the just shall dwell with him in a place called Gimle, or Vingolf, the palace of friendship; but wicked men shall go to Hela, or death, and from thence to Nislheim, or the abode of the wicked, which is below in the ninth world. It inculcates also the belief of several inferior gods, and of goddesses, the chief of whom is Frigga, or Frea, i. e. lady, meaning hereby the earth, who was the spouse of Odin, or the Supreme God; whence we may infer that, according to the opinion of these ancient philosophers, this Odin was the active principle or soul of the world, which uniting itself with matter, had thereby put it into a condition to produce the intelligencies, or inferior gods, and men, and all other creatures. The Edda likewise teaches the existence of an evil being, called Loke, the calumniator of the gods, the artificer of fraud, who surpasses all other beings in cunning and perfidy. It teaches the creation of all things out of an abyss or chaos; the final destruction of the world by fire; the absorption of the inferior divinities, both good and bad, into the bosom of the grand divinity, from whom all things proceeded, as emanations of his essence, and who will survive all things; and the renovation of the earth in an improved state. Fables 1, 2. 10. 16. 33: For a farther account of the Edda, see Mallet's Northern Antiquities, vol. ii. 1770, passim.

To **E'DDER.** *v. a.* To bind a fence (*Mortimer*).

E'dder. *s.* Such fencewood as is commonly put upon the top of fences (*Tusser*).

EDDISH, or Eadish, the latter pasture, or grass, which comes after mowing, or reaping; otherwise called ear-grass, earsh, and etch.

E'DDY. *s.* (eꝺ, backward, again, and ea, water, Saxon.) 1. The water that by some repercussion, or opposite wind, runs contrary to the main stream (*Dryden*). 2. Whirlpool; circular motion (*Dryden*).

E'ddy. *a.* Whirling; moving circularly (*Dryden*).

EDDYSTONE or Edystone rocks, so remarkable for the light-house built on them, obtained their name from the great variety of contrary sets of the tide or current in their vicinity. They are situated nearly S.S.W. from the middle of Plymouth sound, according to the true meridian. The distance from the port of Plymouth is nearly fourteen miles, and from the promontory called Ramhead about ten miles. They are almost in the line, but somewhat within it, which joins the Start and the Lizard points; and as they lie nearly in the direction of vessels coasting up and down the channel, they were necessarily, before the establishment of a light-house, very dangerous, and often fatal to ships under such circumstances. Their situation, likewise, with regard to the bay of Biscay and Atlantic ocean, is such, that they lie open to the swells of the bay and ocean from all the south-western points of the compass: which swells are generally allowed by mariners to be very great and heavy in those seas, and particularly in the bay of Biscay. It is to be observed, that the soundings of the sea from the south-westward toward the Edystone are from eighty fathoms to forty, and everywhere till you come near the Edystone the sea is full thirty fathoms in depth, so that all the heavy seas from the south-west come uncontrouled upon the Edystone rocks, and break on them with the utmost fury.

The force and height of these seas is increased by the circumstance of the rocks stretching across the channel, in a north and south direction, to the length of above a hundred fathoms, and by their lying in a sloping manner toward the south-west quarter. This stiving of the rocks, as it is technically called, does not cease at low water, but still goes on progressively; so that, at fifty fathoms westward, there are twelve fathoms water; nor do they terminate altogether at the distance of a mile. From this configuration it happens, that the seas are swelled to such a degree in storms and hard gales of wind, as to break on the rocks with the utmost violence.

The effect of this slope is likewise sensibly felt in moderate, and even in calm weather; for the libration of the water, caused in the bay of Biscay in hard gales at south-west, continues in those deep waters for many days, though succeeded by a calm; insomuch, that when the sea is to all appearance smooth and even, and its surface unruffled by the slightest breeze, yet those librations still continuing, which are called the ground-swell, and meeting the slope of the rocks, the sea breaks upon them in a frightful manner, so as not only to obstruct any work being done on the rock, but even the landing upon it, when, figuratively speaking, you might go to sea in a walnut shell. A circumstance which still farther increases the difficulty of working on the rock is, there being a sudden drop of the surface of the rock, forming a step of about four and a half, or five feet high; so that the seas, which in moderate weather come swelling to this part, meet so sudden a check, that they frequently fly to the height of thirty or forty feet.

Notwithstanding these difficulties, it is not surprising that the dangers to which navigators were exposed by the Edystone rocks should make a commercial nation desirous of having a light-house on them. The wonder is, that any one should be found hardy enough to undertake the building. Such a man was first found in the person of Henry Winstanley, of Littlebury, in Essex, gent. who, in the year 1696, was furnished by the master, wardens, and assistants, of the Trinity house, of Deptford Strond, with the necessary powers to carry the design into execution. He entered upon his undertaking in 1696, and completed it in four years. This gentleman was so certain of the stability of his structure, that he declared it to be his wish to be in it "during the greatest storm that ever blew under the face of the heavens." Mr. Winstanley was but too amply gratified in this wish; for while he was there with his workmen and light-keepers, that dreadful storm began, which raged most violently on the 26th of November 1703, in the night; and of all the accounts of the kind which history furnishes us with, we have none that has exceeded this in Great Britain, or was more injurious or extensive in its devastation. The next morning, November 27th, when the violence of the storm was so much abated that it could be seen whether the light-house had suffered by it, nothing appeared standing, but, upon a nearer inspection, some of the large irons by which the work was fixed upon the rock; nor were any of the people, or any of the materials of the building, ever found afterwards.

In 1709, another light-house was built of wood, on a very different construction, by Mr. John Rudyerd, then a silk-mercer on Ludgate-hill. This was a very ingenious structure: after it had braved the elements for forty-six years, it was burnt to the ground in 1755. On the destruction of this light-house, that excellent mechanic and engineer Mr. Smeaton was chosen as the fittest person to build another. It was with some difficulty that he was able to persuade the proprietors, that a stone building, properly constructed, would in all respects be preferable to one of wood; but having at last convinced them, he turned his thoughts to the shape which was most suitable to a building so critically situated. Reflecting on the structure of the former buildings, it seemed a material improvement to procure, if possible, an enlargement of the base, without increasing the size of the waist, or that part of the building which is between the top of the rock and the top of the solid work. Hence he thought a greater degree of strength and stiffness would be gained, accompanied with less resistance to the acting power. On this occasion, the natural figure of the waist, or bole of a large spreading oak, occurred to Mr. Smeaton. "Let us (says he) consider its particular figure. Connected with its roots, which lie hid below ground, it rises from the surface with a large swelling base, which at the height of one diameter is generally reduced by an elegant curve, concave to the eye, to a diameter less by at least one-third, and sometimes to half its original base. From thence, its taper diminishing more slowly, its sides by degrees come into a perpendicular, and for some height form a cylinder. After that, a preparation of more circumference becomes necessary, for the strong insertion and establishment of the principal boughs, which produces a swelling of its diameter. Now we can hardly doubt, but that every section of the tree is nearly of an equal strength in proportion to what it has to resist; and were we to lop off its principal boughs, and expose it in that state to a rapid current of water, we should find it as capable of resisting the action of the heavier fluid, when divested of the greater part of its clothing, as it was that of the lighter, when all its spreading ornaments were exposed to the fury of the wind: and hence we may derive an idea of what the proper shape of a column of the greatest stability ought to be, to resist the action of external violence, when the quantity of matter is given of which it is to be composed."

With these views, as to the proper form of the superstructure, Mr. Smeaton began the work on the 2d of April, 1757, and finished it August 4, 1759. The rock, which slopes towards the S.W. is cut into horizontal steps, into which are dove-tailed, and united by a strong cement, Portland stone, and granite. The whole, to the height of thirty-five feet from the foundation, is a solid of stones, engrafted into each other, and united by every means of additional strength. The building has four rooms, one over the other, and at the top a gallery and lantern. The stone floors are flat above, but concave beneath, and are kept from pressing against the sides of the building by a chain let into the walls. It is nearly eighty feet high, and since its completion has been assaulted by the fury of the elements, without suffering the smallest injury.

We regret that we cannot with propriety trace out the progress of this great work, and shew with what skill and judgment this unparalleled engineer overcame the greatest difficulties: we, however, beg to recommend to our curious readers Mr. Smeaton's own Account of the Eddystone Light-house, not doubting that they will be highly gratified by the perusal. According to the Requisite Tables, this light-house is situated in lat. 50. 8 N. Lon. 4. 24 W. of Greenwich, or 4. 18. 23 W. of London.

EDELINCK (Gerard), an eminent engraver, born at Antwerp, in 1641. He resided in France, where he executed some fine pieces, as the picture of the holy family by Raphael, and the tent of Darius by le Brun. He was patronized by Louis XIV. and died in 1707.

EDEMA (Gerard), a Dutch landscape painter, who went to America, on purpose to observe the plants and insects of that country. He came to London in 1670, and became famous for painting landscapes. He died about 1700.

EDEMATO'SE. *a.* (οιδημα.) Swelling; full of humours (*Arbuthnot*).

EDEN. (*pleasure and delight.*) A province of the East, called by Moses the land and the garden of Eden. Many conjectures have been formed about the situation of Eden: it is not consistent with our purpose to wander into the field of conjecture, we shall, therefore, just state, that the most probable opinion is, that the garden of Eden was situated somewhat to the N.W. of the Persian gulph, in about lat. 31 N. lon. 65 E. from Ferro. The reasons which induce us to prefer this situation may be seen in Wells's Geography, vol. i. p. 9, &c. or in Worthington's Theory of the Earth. This word Eden, from its meaning, has been imposed as a proper name of several places of a more than ordinarily delightful situation: as, for instance, a town on mount Lebanon, mentioned in Amos i. v. 5. Sir William Jones says, "it is observable, that *Aden*, in the Eastern dialects, is precisely the same word with Eden, which we apply to the garden of Paradise: it has two senses, according to a slight difference in its pronunciation; its first meaning is *a settled abode*; its second, *delight*, *softness*, or *tranquillity*."

Eden, a river which rises in Westmoreland, on the confines of Yorkshire, and running N. by Appleby and Carlisle, falls into Solway frith.

EDE'NTATED. *a.* (*edentatus*, Lat.) Deprived of teeth.

EDGAR, king of England, succeeded his brother Edwin in 959, at the age of sixteen, but was not crowned till he was thirty-six. The moderation of his reign procured him the name of Peaceable. He vanquished the Scots, and laid Wales under a yearly tribute of a certain number of wolves' heads, which effectually cleared the country of those animals. He subdued one part of Ireland, and fitted out a great fleet of ships, which defended his kingdoms from invasion. On the death of his queen Egelflida, he sent earl Athelwold to see whether the report of the beauty of Elfrida was true. The earl fell in love with the lady, gave his master a false report, and married her. He was afterwards slain in hunting, and Elfrida became the wife of Edgar, who died in 975, aged thirty-three.

EDGE. *s.* (ecʒe, Saxon.) 1. The thin or cutting part of a blade (*Shakspeare*). 2. A narrow part rising from a broader (*Mortimer*). 3. Brink; margin; extremity (*Pope*). 4. Sharpness; intenseness of desire (*Dryden*). 5. Keenness; acrimony of temper (*Shakspeare*). 6. *To set teeth on* Edge. To cause a tingling pain in the teeth (*Bacon*).

To Edge. *v. a.* (from the noun.) 1. To sharpen; to enable to cut (*Dryden*). 2. To furnish with an edge (*Dryden*). 3. To border; to fringe (*Pope*). 4. To exasperate; to embitter (*Hayward*). 5. To put forward beyond a line (*Locke*).

To Edge. *v. n.* To move against any power.

E'DGED. *part. a.* (from *edge*) Sharp; not blunt (*Digby*).

E'DGELESS. *a.* (from *edge*.) Blunt; obtuse; unable to cut (*Shakspeare*).

E'DGETOOL. *s.* (*edge* and *tool*.) A tool made sharp to cut (*L'Estrange*).

E'DGEWISE. *ad.* (*edge* and *wise*). With the edge put into any particular direction (*Ray*).

E'DGING. *s.* (from *edge*.) 1. What is added to any thing by way of ornament (*Dryden*). 2. A narrow lace.

EDGINGS, among gardeners, the series of small but durable plants, set round the edges or borders of flower-beds, &c. The best and most durable plant for this use is box, which, if well planted and rightly managed, will continue in strength and beauty for many years. The seasons for planting are the autumn, and very early in the spring; and the best species for this purpose is the dwarf Dutch box.

EDHILING, Edhilingus, an ancient appellation of the nobility among the Anglo-Saxons. The Saxon nation, says Nithard, Hist. lib. iv. is divided into three orders, or classes of people; the edhilingi, the frilingi, and the lazzi; which signify the nobility, the freemen, and the vassals or slaves.' Instead of edhiling, we sometimes meet with atheling, or ætheling; which appellation was likewise given to the king's son, and the presumptive heir of the crown. See ATHELING.

E'DIBLE. *a.* (from *edo*, Latin.) Fit to be eaten; fit for food (*More*).

E'DICT. *s.* (*edictum*, Lat.) A proclamation of command or prohibition (*Addison*).

EDICT, in matters of polity, an order or instrument, signed and sealed by a prince, to serve as a law to his subjects. We find frequent mention of the edicts of the prætor, the ordinances of that officer in the Roman law. In the French law, the edicts are of several kinds; some importing a new law or regulation; others, the erection of new offices, establishments of duties, rents, &c. and sometimes articles of pacification. In France, edicts are much the same as a proclamation is with us, but with this difference, that the former have the authority of a law in themselves, from the power which issues them forth; whereas the latter are only declarations of a law, to which they refer, and have no power in themselves.

Edicts can have no room in Britain, because that the enacting of laws is lodged in the parliament, and not in the king.

Edicts are all sealed with green wax, to shew that they are perpetual and irrevocable.

EDIFICA'TION. *s.* (*ædificatio*, Latin.) 1. The act of building up man in the faith; improvement in holiness (*Taylor*). 2. Improvement; instruction (*Addison*).

E'DIFICE. *s.* (*ædificium*, Lat.) A fabric; a building; a structure (*Bentley*).

E'DIFIER. *s.* (from *edify*.) One that improves or instructs another.

To **E'DIFY.** *v. n.* (*edifico*, Latin.) 1. To build (*Chapman*). 2. To instruct; to improve (*Hooker*). 3. To teach; to persuade: obsolete (*Bacon*).

E'DILE. *s.* (*ædilis*, Lat.) The title of a magistrate in old Rome (*Shakspeare*).

EDINBURGH, the capital of Scotland, situated in a county of the same name, on three hills, or ridges, which run from E. to W. in a direction almost parallel. On the middle ridge, which is narrow and steep, stands the Old Town. The North Town is seated on an elevated plain, gently sloping on every side; and the S. part of the city stands also on a similar sloping eminence. The situation of the Old Town is very peculiar and striking. A fine street, a mile in length, and generally ninety feet broad, extends from the castle on the W. summit of the hill, to Holyrood House. It is called the High Street. On each side of this steep hill, the houses form narrow lanes, which are called closes, and extend N. and S. Many of them are very lofty, but so crowded, and as it were piled upon each other, that they are far from being distinguished either for elegance or cleanliness. The form of the Old Town resembles that of a turtle; the castle being the head; the High Street, the ridge of the back; the closes, the shelving sides; and Holyrood House, the tail. On each side of this hill was once a lake. The S. valley, drained of its waters, is occupied by Cowgate Street. The N. valley is also drained; but a disagreeable morass remains, which is still called the N. Loch. The ancient castle (the origin of which no historian can trace) is seated on a high, craggy, and precipitous rock, with a drawbridge on the only side that is accessible. In former times, therefore, it was deemed impregnable. The visitors to this castle are here shewn the apartment in which was born James VI. of Scotland, afterwards James I. of England. On the S. side of the High Street is the ancient church of St. Giles, a fine Gothic structure, which has four churches under its roof. Near this is the building in which the Scotch parliaments were usually convened. It is now occupied by the courts of justice; and its magnificent lofty hall merits particular attention. The palace of Holyrood House forms a grand quadrangle, with a court in the centre surrounded by piazzas. The N.W. towers were built by James V. and the whole was completed in the reign of Charles II.

The North Town has many new squares and streets, adorned with uniform and elegant houses. The buildings of the South Town are likewise elegant and extensive, though not equal to those of the North: and the New College, began in 1789, forms a very striking object. The university of Edinburgh was founded in 1581, by queen Mary and James VI. and has risen to a very high degree of reputation. The professors have small salaries, and are classed into divinity, Hebrew, church-history, logic, Greek, humanity, mathematics, moral philosophy, natural philosophy, universal history, Scotch law, civil law, law of nature and nations, rhetoric, botany, materia medica, practice of medicine, chemistry, anatomy, midwifery, natural history, astronomy, and physiology. Most of the present professors are men of great eminence in their respective departments, as the bare mention of some of their names will prove: we adduce those of Dalzel, Leslie, Dugald Stewart, Playfair, Gregory, Hope, Monro, and Rutherford. The number of students is generally from 1000 to 1400, of whom about 400 study medicine. As a school of medicine, we may safely hazard the assertion, that no university in Europe is equal to that of Edinburgh, and this is sufficiently marked by the general resort of students in this profession, from every part of Europe. The city is governed by a lord provost, a dean of guild, a guild council, and twenty-five common councilmen. Here are fourteen incorporated trades. The town, with N. and S. Leith, contains 82,560 inhabitants, and sends one member to the British parliament. Distance from London, 378 miles. Lat. 55. 53 N. Lon. 3. 13 W.

EDINBURGHSHIRE, a county of Scotland, called also Mid-Lothian; bounded on the N. by Fifeshire, from which it is divided by the frith of Forth; on the E. by the shires of Haddington and Berwick; on the S. by that of Peebles; and on the N.W. by Lanerkshire and Linlithgow. Its length is thirty-five miles; its greatest breadth sixteen: its inhabitants amount to 122,954.

EDITION. *s.* (*editio*, Latin.) 1. Publication of any thing, particularly of a book (*Burnet*). 2. Republication, with revisal (*Baker*).

E'DITOR. *s.* (*editor*, Lat.) Publisher; he that revises or prepares any work for publication (*Addison*).

EDMUND I. king of England, son of Edward the Elder, succeeded his brother Ethelstan, in 941. He drove the Danes from the kingdom of Mercia, subdued Northumberland, and gave Cumberland to the king of Scotland, in consideration of his assistance. He was stabbed at a feast in Gloucestershire, by a robber, whom he had sentenced to be banished, in 948.

EDMUND II. or *Iron Side*, third son of king Ethelred, whom he succeeded in 1016; but being opposed by Canute, he agreed to a participation of the kingdom. Edmund dying the same year, Canute took the whole to himself.

To E'DUCATE. *v. a.* (*educo*, Latin.) To bring up a person; to give instruction to a person during his minority.

EDUCA'TION. *s.* The formation of manners in youth (*Johnson*). It may be otherwise defined as, that series of means by which the human understanding is gradually enlightened, and the dispositions of the human heart are formed and called forth: it occupies the period between the earliest infancy, and the time when we consider ourselves as qualified to take a part in active life.

There are few terms in the English language that convey so different an idea to different minds as that of education. Among the great majority of the middle classes of society, it means nothing more than imparting to their children the usual acquirements of reading, writing, and arithmetic, with some hopeless attempts to lay the foundations for a knowledge of the learned languages. With those employed in the active and mercantile world, it means the qualifying their sons, by habits of industry and acuteness, to avail themselves of the circumstances in which they may be placed, for the acquisition of wealth and consequence: but with those who estimate with an impartial eye the value of the blessings which life affords, the business of education is a still more important task. It is the formation of the heart to virtue, of the mind to cheerfulness, of the understanding to wisdom. It is the teaching a child to open his eyes to the circumstances by which he is surrounded; to distinguish virtue from vice; truth from falsehood; beauty from deformity; and happiness from misery; to qualify him to attribute neither more nor less than its proper importance to every acquisition and every pursuit; and instead of being borne along by the follies and the prejudices of mankind, to raise himself above them to that degree of mental eminence and moral excellence, which will enable him to judge distinctly of the value of all earthly enjoyments, and, by the strength of his own faculties, to select those, and those only, which will contribute to his temporal and eternal good.

Education, says Dr. Cogan, when developing its influence upon the passions, introduces to an intimate acquaintance with numberless objects which are totally unknown to the ignorant; and every object possesses some quality of a pleasant or unpleasant nature, proportionably multiplying or diversifying our agreeable or disagreeable sensations. With the ignorant, objects are comparatively few. Scenes before them are of no great extent; and even these are overlooked by the majority, whose years pass away in a kind of sensitive indolence, without apathy or affection.

Sometimes, however, a natural acuteness of understanding is observable among the most illiterate, accompanied with lively sensations and very strong affections; and when they are once aroused, by objects that appear interesting, their passions are most violent. What they know can alone appear important to them, and the very little they possess is their all. Their whole souls are concentrated in that which gives pleasure, and all the powers of body and mind are exerted to repel whatever gives pain. This will indicate the cause of that remarkable strength of passions and affections, both of the benevolent and malevolent kind, so observable in savage nations; and the impetuosity of character so often to be met with among the active and uninformed in every nation.

The cultivated mind, by increasing its acquaintance with innumerable subjects, will inevitably discover some pleasing quality in every object of its pursuit: of consequence, both attention and affections are divided and subdivided into innumerable ramifications; and thus, although enjoyment may upon the whole be augmented by aggregate numbers, yet each individual quality possesses but a moderate share of influence.

The young and inexperienced are generally affected by simple objects. The causes of their joy or anger, sorrow or fear, are seldom complex. As the powers of the mind are more enlarged, the affections are both more diversified, and rendered more complicated. Thus upon the perception of favours and obligations, the joy from good becomes united with gratitude to the author of that good; with love, veneration, respect, for his character; with admiration at the extent of the good, or at some peculiarity in the delicacy and liberality with which it was conferred. Experience introduces the passions of hope and fear, by teaching us the knowledge of good worth possessing, on the one hand, and the accidents to which it is liable on the other.

It is observable, farther, that the young and inexperienced, whose habits are not yet formed, and to whom every thing is new, are most apt to be influenced by the introductory emotions of surprise and wonder. This inexperience renders things and events, which are familiar to others, new and strange to them. They are prone to hasty ecstasies for acquisitions and advantages comparatively trifling, and to be agitated by small or imaginary evils, because their imaginations have not been corrected by experience. But, if these passions from more simple causes are frequently stronger in them than in others, it is equally true that their affections are less permanent. A rapid succession of novelties, and the immense variety which increased knowledge introduces, quickly efface the preceding impression.

But the very extent of this subject enjoins brevity. A whole Encyclopædia could scarcely do it justice. The infinite diversity of pursuits which in this age engage the attention of an awakened world, are accompanied by an equal diversity of predilections; they present an infinite variety of qualities to the inquisitive mind, which excite their correspondent emotions and affections.

The business of education comprehends much indeed. It includes the circumstances of the child in regard to local situation, and the manner in which the necessaries and conveniences of life are supplied to him; the degree of care and tenderness with which he is nursed in infancy; the examples set before him by parents, preceptors, and companions; the degree of restraint or licentiousness to which he is accustomed; the various bodily exercises, languages, arts, and sciences, which are taught him; and the method and order in which they are communicated; the arts of overcoming prejudices, of guarding against evil influences, of conquering temptations, and of governing himself; and it constantly regards, as of the greatest importance, the imbuing the mind with the principles of morality and religion.

In different periods of society, in different climates, and under different forms of government, various institutions have naturally prevailed in the education of youth; and even in every different family, the children are educated in a different manner, according to the varieties in the situation, dispositions, and abilities, of the parents. The education of youth being an object of the highest importance, has not only engaged the anxious care of parents, but has likewise often attracted the notice of legislators and philosophers. Among the latter we recognise the names of some of the most illustrious. Our sublime poet Milton wrote a valuable treatise on education, as did the great Mr. Locke. But that which professes most immediately to follow nature is the treatise written by Rousseau: as we, however, are such old-fashioned moralists, as to be of opinion, that many of the principles of human nature, in its present lapsed state, require rather to be corrected by education, than to be followed, we hope that none of our readers will so far follow nature, as to adopt either the system or the principles of Rousseau. Dr. Watts has also treated on education in his Improvement of the Mind: a work which merits high commendation. It was no less a moralist than Dr. Johnson, who said, "Whoever has the care of instructing others, may be charged with deficience in his duty if this book is not recommended." Of late, indeed, the subject of education has been well treated by several: at present we have in our recollection the performances of Knox, Edgeworth, Barrow, Miss Hamilton, and Miss H. More.

To **EDU'CE.** *v. a.* (*educo*, Lat.) To bring out; to extract (*Glanville*).

EDU'CTION. *s.* (from *educe*.) The act of bringing any thing into view.

EDU'LCORANTS. (from *edulco*, to make sweet.) The making sweet any substance, or the rendering a preparation more mild.

EDU'LCORATE. *v. a.* (from *dulcis*, Lat.) To sweeten.

EDULCORA'TION. (*absussen*, Germ.) This term is applied in chemistry to the process of washing out from a precipitate any excess of acid, or alkali, or compound salt, that may adhere to it. The usual way is to place the precipitate on a filter, and when nearly all the liquor has drained away from it, to fill up the filter again with clean and pure water, either hot or cold, and as soon as this has passed through, to replace it with fresh, till the last portions that drain are wholly tasteless, and produce no change on turmeric or litmus paper. This method, however, is often less effectual, and is always more tedious than the process which is had recourse to at present. When the precipitate is deposited, instead of throwing it on a filter, pour it into a large silver crucible, and boil it with some water; after this withdraw it from the fire, allow it a few minutes to subside, and draw off the clear liquor; then add fresh water to the residue, and again boil it; and proceed thus till all soluble impurities are got rid of. A single half hour thus employed will finish more work than a whole day in the common method, and the necessary loss upon the precipitate is considerably less, which is a circumstance of no small importance to the accuracy of an analysis.

EDWARD the Elder, son of Alfred the Great, succeeded his father in 900, and subdued the Danes who were settled in the north of England, and extended his dominions as far as Scotland. He died in 925. (*Watkins*).

Edward the Younger, son of Edgar the Great, king of England, born in 962, and crowned in 975. He was basely murdered by order of his stepmother Elfrida, at Corfe Castle, after a reign of three years. The church of Rome esteemed him a martyr. (*Watkins*).

Edward, king of England, called, on account of his piety, the Confessor, was the son of Ethelred. He succeeded Canute II. in 1041. He was very partial to the Normans, whom he employed and preferred rather than his own subjects, which opened the way to the Norman conquest. He conquered Macbeth, the Scottish tyrant, and reduced the Welch. He was weak enough to consult William of Normandy about the choice of a successor, which furnished that prince with a plea for invading the kingdom after the death of Edward, which happened in 1066. He rebuilt Westminster abbey, in which he was the first who was buried. He was canonized by pope Alexander III.

Edward I. king of England, surnamed Long Shanks, was son of Henry III. and born at Winchester, 1239. He was taller by the head than men generally are; and his person was well made; but his legs being rather too long, he thence obtained the name of Long Shanks. He carried on a crusade against the Saracens, where, with only ten thousand Englishmen, he struck a general panic into the infidels. He there narrowly escaped being murdered, being wounded by an assassin in the arm with a poisoned dagger; and it is said that he owed his life to the affection of Eleanor his wife, who sucked the venom out of the wound. While he was on his return from Palestine, he heard of the death of his father, which happened in 1272, and arriving in England with his queen, they were both crowned on the 19th of August, 1274. He began his reign by confirming the Magna Charta, and by making a strict enquiry into the affairs of his kingdom. He then defeated and slew Lewellyn, king of Wales, who had revolted, and afterwards summoning a parliament at Ruthen, it was there resolved that Wales should be united to England: when some of the Welsh nobles telling the king that he would never peaceably enjoy their country, till they were governed by a prince of their own nation, he sent for the queen to lie-in at Carnarvon, where being delivered of a prince, the states acknowledged him for their sovereign, and since that time the eldest sons of the kings of England have borne the title of prince of Wales. Soon after queen Eleanor dying at Grantham, in Lincolnshire, Edward erected a cross at every place where the corpse rested in the way to Westminster.

Edward then carrying his arms into Scotland, took Berwick, Dunbar, and Edinburgh; and John Baliol, their king, repairing to Edward, renewed his oath of fidelity, and put the whole kingdom in his power. But while Edward was endeavouring to recover some dominions he had lost in France by treachery, the brave William Wallace rose up in defence of his country, and having suddenly dispossessed the English of all the strong places they held, was declared regent of the kingdom; on which Edward hastily returned from France, advanced into Scotland at the head of a powerful army, and defeated Wallace, who several years after was betrayed into the hands of the English, and sent to London, where that great hero suffered the death of a traitor. Edward was seized with a dysentery, and died in the little town of Burg, the 7th of July, 1307, in the sixty-eighth year of his age, and the thirty-fifth of his reign, and was interred in Westminster-abbey.

Edward II. king of England, was born at Carnarvon, April 25, 1284, and succeeded his father Edward I. in 1307, at twenty-three years of age. He recalled Pierce Gaveston, whom his father had banished. Then marrying Isabella, the daughter of the French king, they were both crowned at Westminster, the 24th of February, 1308. His ridiculous fondness for Gaveston occasioned innumerable disputes, till at length the barons had recourse to arms, and Gaveston was beheaded. In the mean time the Scots obtained three victories over the English, and made themselves masters of every place in Scotland. This weak prince raised the two Spencers, father and son, to the summit of power; who being banished by the parliament, the king levied an army, took some castles from the barons, and recalled his two favourites.

Some time afterwards, he invaded Scotland; but wanting provisions, he returned without striking a blow: on which Bruce, king of Scotland, pursued him to York, and, after having destroyed twenty thousand of the English, consented to a peace. The two Spencers soon incurred the general hatred; and queen Isabella flying to France with her son, the nobility sent for her; when landing, and proceeding towards London with a numerous army, the king fled into the west: she still pursued him, and he set sail for Ireland; but was driven back into Wales, and being taken, was sent prisoner to the queen. Hugh Spencer, the father, was hanged and quartered, without a trial, and the young Spencer hanged on a gallows fifty feet high.

The queen was entirely governed by Mortimer, earl of March, whom she took to her bed: and the king being obliged to resign the crown in 1327, his son Edward was proclaimed king. After which, the late sovereign was treated with the greatest indignities, and at last inhumanly murdered; for some assassins having covered him with a feather-bed, held him down, while others conveyed a horn-pipe up his body, through which they thrust a red-hot iron, and thus burnt his bowels.

Edward III. one of the greatest kings of England, was born at Windsor, November 15, 1312, and was placed on the throne on the 26th day of January, 1327, at fourteen years of age, while his father, Edward II. was living. Though a regency was appointed by the parliament, the queen and Roger Mortimer had the sole authority; and influenced by them, the young king not only renounced all pretensions to Scotland, but gave his sister in marriage to David Bruce, king of the Scots: yet afterwards becoming sensible of the queen's ill conduct, he confined her for life, and caused Mortimer, earl of March, to be hanged at Tyburn. He then broke the truce with Scotland, invaded that kingdom, and obliged king David to fly with his queen into France, when he set up Edward Baliol in his room. Edward now laid claim to France; for Charles, his mother's brother, dying Philip of Valois had possessed himself of the kingdom, alleging the Salic law; but Edward asserted, that the Salic law, in excluding females from the succession, did not exclude their male issue, on which he grounded his title. His first campaign passed without bloodshed; but he took the title of king of France, and quartered his arms with the flors de lis, adding the motto, *Dieu et mon droit*, or, God and my right. However, in his next attempt he defeated the French fleet. He then besieged Tournay; but being called home to oppose the Scots, concluded a truce for one year, with Philip king of France. In the next campaign he ravaged all the country, up to the walls of Paris, and his son, the Black Prince of Wales, at sixteen years of age, won the glorious battle of Cressy. Six weeks after this, the queen defeated the Scots, and took king David prisoner. These memorable victories were obtained in 1346. Edward then laid siege to Calais, and having reduced it by famine, returned to England. He soon after sent the Black Prince, who, after taking several towns, totally routed the French army, commanded by king John, who had succeeded Philip; and in this glorious battle, which was fought near Poictiers, took the king, many nobles, and a multitude of private men prisoners, though the French army was six times as numerous as the English. Thus Edward had the honour of having two kings his prisoners at the same time, John of France, and David Bruce, king of Scotland. The king of Scotland, who resided at Odiham, in Hampshire, was afterwards ransomed for one hundred thousand marks; and the French king, who lived at the Savoy, agreed to pay for his ransom five hundred thousand pounds, and a considerable extent of country.

Charles, king of France, afterwards carried on a war with Edward, when the English were driven from all the places they had so nobly conquered, to which the death of the Black Prince greatly contributed.

Edward distinguished himself by instituting the order of the garter; and died at Richmond, in Surry, the 21st of June, 1377, in the fifty-sixth year of his age, and the fifty-first of his reign, and was interred in Westminster-abbey. He was succeeded by Richard II. the son of Edward the Black Prince.

Edward IV. king of England, was the son of Richard, duke of York, and disputed the crown with Henry VI. who was of the house of Lancaster. Between these two families a great number of battles were fought, with different success; but at length Edward obtained the crown, March 5, 1461, by gaining a signal victory over Henry VI. whom he forced to fly into Scotland, with Margaret of Anjou, his consort. He afterwards gained another victory over the same unhappy prince, who after his defeat, came into England in disguise, and being seized, was carried to London, with his legs tied under his horse's belly, and then confined in the Tower. The earl of Warwick, who had chiefly contributed to raise Edward to the throne, was employed by that prince to negociate a marriage for him in France, and in the mean time marrying Elizabeth, the widow of sir John Grey, with whom the earl was in love, that nobleman was so exasperated, that he raised a rebellion, in which he twice defeated the king's forces, and afterwards took his majesty prisoner, and confined him in Midleham castle; from whence he escaped, and joining lord Hastings, in Lancashire, returned to London, when another battle ensued, and Warwick being defeated, was obliged to fly into France; but soon after landing at Dartmouth with a few troops, he soon increased them to sixty thousand men, upon which Edward also raised a numerous army at Nottingham; but as his enemies were advancing, the cry of king Henry being raised in his camp, Edward fled, and escaped into Flanders. Warwick then took Henry out of the Tower, and caused him to be acknowledged king of England. But Edward afterwards returning with a small force, was received at London with acclamations of joy; and Henry was once more confined in the Tower. Edward then marched against the earl of Warwick, and routed his army in a great battle near Barnet, where the earl himself was slain, with seventeen thousand of his men.

Some time after, the queen having assembled an army, king Edward defeated her, and took her prisoner, with her son prince Edward, who was soon after massacred, in the eighteenth year of his age; and soon after, king Henry, his father, was murdered in the Tower, or, as others say, died with grief, in the fiftieth year of his age. Queen Margaret, after being four years confined, was ransomed by her father for fifty thousand crowns. Edward caused his brother, the duke of Clarence, to be drowned in a butt of sack. Edward being now at peace, spent his time in indolence and debauchery. His favourite mistress was Jane Shore. He died at Westminster, on the 9th of April, 1483, in the forty-second year of his age, and the twenty-third of his reign.

Edward V. king of England, eldest son of Edward IV. succeeded his father in 1483, at twelve years of age. He was at Ludlow when his father died; but being sent for to London, he on the fourth of May received the oaths of the principal nobility, and his uncle Richard, duke of Gloucester, was made protector of the king and kingdom. He obliged the queen to deliver up to him the duke of York, the king's brother, and sent them both to the Tower, under pretence of their waiting there till every thing was prepared for the coronation. Mean while the duke of Gloucester, by the assistance of the duke of Buckingham, sir John Shaw, lord mayor of London, and Dr. Shaw, his brother, had the two young princes declared illegitimate, and then caused himself to be acknowledged king of England; pretending to accept the crown with reluctance; though he had put to death lord Hastings for no other crime but his being warmly attached to the young king; however, as that nobleman was greatly beloved by the people, Gloucester pretended that his ambition and sorceries endangered the kingdom; the queen and Jane Shore were accused as his colleagues, and the latter was taken into custody, but was soon after released on doing penance. Sir Robert Brackenbury, lieutenant of the Tower, refusing to comply with Richard's cruel designs, he for one night only gave the command of that fortress to sir James Tyrrell, and he procured two villains, who in the dead of the night entered the chamber where the princes lay, and smothered them in bed. Thus died Edward V. after a reign of only three months.

Edward VI. king of England, and the only son of Henry VIII. and Jane Seymour, was born October 12, 1537, and ascended the throne at nine years of age, at which time he was well skilled in the Latin and French tongues, and had obtained some knowledge of the Greek, Italian, and Spanish. His person was very beautiful; he had great sweetness of temper, and was remarkable for his piety and humanity. He founded the hospitals of Christ-church, London, and St. Thomas, Southwark. He was committed to the care of sixteen persons, whom Henry had nominated regents of the kingdom, the principal of whom was the earl of Hertford, the king's uncle by the mother's side, who was soon after created duke of Somerset. The young queen of Scotland was demanded in marriage for king Edward, but the same proposal being made by France, in behalf of the dauphin, she was sent into that kingdom, on which the duke of Somerset invaded Scotland, and routed the Scots army at Musleburgh. The great power of the duke of Somerset raised him many enemies, the chief of whom was Thomas, lord Seymour; and articles of accusation being exhibited against him, he was attainted in parliament, and condemned and beheaded, without being brought to an open trial. However, the duke of Somerset himself was some time after impeached, and charged with a design to seize the king, and to imprison the earl of Warwick; for this he was condemned, and the young king being in a manner forced to sign the sentence, he was executed some time after. The earl of Warwick, now duke of Northumberland, succeeded to the earl of Somerset's power, and at length, on the king's being taken ill of the measles, married lord Guildford Dudley, his fourth son, to the lady Jane Grey, eldest daughter to the duke of Suffolk, and persuaded Edward to settle the crown on her, his sisters, Mary and Elizabeth, having been both declared illegitimate during the life-time of their father; and the prince, hoping to save the reformation from impending destruction, appointed her his successor, and soon after died at Greenwich, on the 6th of July, 1553, in the sixteenth year of his age, and the seventh of his reign.

Edward, prince of Wales, commonly called the Black Prince, from the colour of his armour. He was the eldest son of Edward III. and born in 1330. He accompanied his father to France when he was but sixteen years old, and distinguished himself there above all the warriors of his age, particularly at the battle of Cressy. He there took the standard of the king of Bohemia, embroidered with three ostrich feathers, and having this motto, *ich dien*. This he always wore, and it has continued to be the arms of the princes of Wales ever since. He also won the victory at Poictiers, where he took John, king of France, and his son prisoners, and brought them to London. This prince married the lady Joanna, daughter of Edmond, earl of Kent, brother to Edward II. a widow, by whom he had a son, who was afterwards Richard II. Edward died, to the grief of the whole nation, in 1376.

EDWARDS (George), an English ornithologist, born at Stratford, in Sussex, in 1694. He was bred to trade, but on the expiration of his apprenticeship he renounced the shop, and went abroad. In 1716 he visited Holland, and two years afterwards he went to Norway. On his return to England, he was appointed librarian of the college of physicians, where also he had apartments allotted to him. He published the History of Birds, in four vols. 4to. to which he afterwards added three volumes more, entitled, Gleanings of Natural History. He died in 1773. (*Watkins*).

Edwards (Jonathan), the most celebrated of the American divines, was born in 1703. He entered at Yale-college, in Connecticut, in 1716, took his bachelor's degree in 1720, and his master of arts' degree in 1723. His mental powers expanded so early and so vigorously, that at the age of thirteen he read Locke's Essay on the Human Understanding; and, even then, discovered a penetration and comprehension of mind which portended his future celebrity. In August, 1722, Mr. Edwards was invited to preach to the English Presbyterians in New York; but, the society being too small to maintain a minister, he left them in 1723, and the succeeding year was chosen tutor of Yale-college. In 1726 he resigned his tutorship, in consequence of an invitation from Northampton, in Connecticut, to assist Mr. Stoddard his grandfather: he continued to discharge the ministerial functions there till 1750, when he was dismissed for attempting to reform the church from some disgraceful principles and practices!

After this, Mr. Edwards employed six years in the instruction of savage Indians at Stockbridge: in this retirement he composed his most valuable works. In 1757, the trustees of the college of Prince Town, in New Jersey, chose Mr. Edwards to be the president of that seminary. He removed from Stockbridge to Prince Town, in January, 1758; where, however, he had scarcely entered upon the duties of his new office, before he fell sick of the small-pox, which terminated his highly useful and exemplary life, March 22, 1758, in the fifty-fifth year of his age.

The following is a list of president Edwards's works: 1. A Narrative of the Conversion of several hundred Souls in Northampton, New England, 1737. 2. Five Sermons on sundry Subjects, 1738. 3. Thoughts on the Revival of Religion in New England, 1742. 4. A Treatise on Religious Affections, 1746. 5. An Attempt to promote the Union of God's People, in extraordinary Prayer for the Revival of Religion. 6. The Life of Mr. David Brainard, Missionary. 7. An Enquiry into the Qualifications for Full Communion. 8. A Reply to the Rev. Mr. Williams's Answer to the Enquiry. 9. An Enquiry into the Freedom of the Will. 10. Several single Sermons. 11. The Christian Doctrine of Original Sin, was in the press when he died. Posthumous: 12. A History of Redemption, 1774; best edition, 1788. 13. His Life, and eighteen Sermons, 1785.

The theological sentiments of president Edwards were highly Calvinistic; and they are often delivered in a very uncouth style. But his investigations are frequently profound, and conducted with much ability; he has, therefore, thrown much light on some very intricate subjects: so that his works, though (with one or two exceptions) not likely to continue popular among general readers, may be advantageously consulted by the theological student.

EDYSTONE. See Eddystone.

To EEK. *v. a.* (eacan, Saxon.) See Eke. 1. To make bigger by the addition of another piece. 2. To supply any deficiency (*Spenser*).

EEL, in ichthyology. See Muræna.

Eel-spear, a forked instrument, with three or four jagged teeth, used for catching eels, by striking it into the mud at the bottoms of rivers, pools, &c.

E'EN. *ad.* Contracted for *even* (*L'Estrange*).

E'FFABLE. *a.* (*effabilis*, Latin.) Utterable; that may be spoken; expressive.

To EFFA'CE. *v. a.* (*effacer*, French.) 1. To destroy any thing painted or carved. 2. To make no more legible or visible; to blot out; to strike out (*Locke*). 3. To destroy; to wear away (*Dryden*).

EFFE'CT. *s.* (*effectus*, Latin.) 1. That which is produced by an operating cause (*Addison*). 2. Consequence; event (*Addison*). 3. Purpose; meaning (*Chronicles*). 4. Consequence intended; success; advantage (*Clarendon*). 5. Completion; perfection (*Prior*). 6. Reality; not mere appearance (*Hooker*). 7. (In the plural.) Goods; moveables (*Shakspeare*).

In speaking of effects under the first of the above senses, the acute and amiable Andrew Baxter has some remarks, which from their excellency and importance demand a place here. "It is impossible (says he) that the effect should be perfecter than its cause, either in kind, or in degree. For if the effect were perfecter in degree than the cause of it, all that degree, or excess of perfection in the effect, which is not in the cause, would be really uncaused; or it would be a perfection effected, without being effected by any thing: that is, effected and not effected. And if the effect were perfecter in kind than the cause that produced it, or contained not only a greater degree of the same kind of perfection, but quite another and superior kind; then that whole species of perfection, and not any degree of it only, would be uncaused, or the effect of nothing; which is yet a greater contradiction than the former. Any one will find, by pursuing this in his own mind, that if it could be true, nothing could be false, nor nothing impossible. No man could assert a thing, which another could not as justly deny. If the cause could communicate to the effect what it had not in itself, then any cause might bring to pass any effect, be the disproportion between them ever so great; nor could limits be set, where this giving away what it had not, or doing what it could not, would end. And at last, all would end in this; that in reality no cause was necessary to produce any effect: for one part of the effect might as well exist without a cause as another. And then I suppose it would be unnecessary to philosophise farther about any thing. If it were possible that one truth could fail, or be not truth; no other truth could be trusted to: but rather all truth would fall with it; because all truth proceeds equally from the same eternal reason or mind, and is equally necessary in it. And the final result of all would be, the denying of this eternal mind itself: and then, indeed, an endless night of darkness would cover the understanding, and the difference between truth and falsehood cease for ever." (*Enquiry on the Human Soul: sect.* 5.)

To Effe'ct. *v. a.* (*efficio*, Latin.) 1. To bring to pass; to attempt with success; to achieve (*Ben Jonson*). 2. To produce as a cause (*Boyle*)

EFFE'CTIBLE. *a.* (from *effect.*) Performable; practicable; feasible (*Brown*).

EFFE'CTIVE. *a.* (from *effect.*) 1. Powerful to produce effects (*Taylor*). 2. Operative; active (*Brown*). 3. Producing effects, efficient (*Taylor*). 4. Having the power of operation; useful.

EFFE'CTIVELY. *ad.* Powerfully; with real operation (*Taylor*).

EFFE'CTLESS. *a.* (from *effect.*) Without effect; impotent; useless (*Shakspeare*).

EFFE'CTOR. *s.* (*effector*, Latin.) 1. He that produces any effect; performer. 2. Maker; creator (*Derham*).

EFFE'CTUAL. *a.* (*effectuel*, French.) 1. Productive of effects; powerful to a degree, adequate to the occasion; efficacious (*Hook.*). 2. Veracious; expressive of facts (*Shakspeare*).

EFFE'CTUALLY. *ad.* In a manner productive of the consequences intended; efficaciously (*South*).

To EFFE'CTUATE *v. a.* (*effectuer*, Fr.) To bring to pass; to fulfil (*Sidney*).

EFFE'MINACY. *s.* (from *effeminate.*) 1. Admission of the qualities of a woman; softness; unmanly delicacy (*Milton*). 2. Lasciviousness; loose pleasure (*Taylor*).

EFFE'MINATE. *a.* (*effeminatus*, Latin.) Having the qualities of a woman; womanish; voluptuous; tender (*Milton*).

To Effe'minate. *v. a.* (*effemino*, Latin.) To make womanish; to weaken; to emasculate; to unman (*Locke*).

To Effe'minate. *v. n.* To grow womanish; to soften; to melt into weakness (*Pope*).

EFFEMINATION. *s.* (from *effeminate.*) The state of one grown womanish; the state of one emasculated or unmanned (*Brown*).

To EFFERVE'SCE. *v. n.* (*effervesco*, Lat.) To generate heat by intestine motion (*Mead*).

EFFERVESCENCE. (*effervescentia*, from *effervesco*, to grow hot.) A small degree of ebullition. That agitation which is produced by mixing an acid and an alkali together.

Effervescence is a rapid disengagement of gass taking place within a liquid. In consequence of this, numerous bubbles rise to the surface, forming a head of froth and bursting with a hissing noise. There is some external resemblance between effervescence and fermentation, only the latter process is much slower and more durable; hence it was, that the ancient chemists applied the term fermentation to all the phænomena which are at present denoted by effervescence, and this misapplication of the term irresistibly induced them to explain the two processes by the same theory. Hence salt of tartar, of wormwood, and in short, all the mild alkalies, as well as the several varieties of carbonated lime, were ranked as fermentable bodies, and the muriatic, nitric, and sulphuric acids, the addition of which produced in them effervescence or fermentation, were called ferments; and as in these cases the ferment was an obvious acid, so they imagined that all real ferments were also essentially acids, but with their properties masked and obtunded by mixture with mucilage, &c. The gass of effervescence is produced by single or double elective affinity; in the former case, it is for the most part carbonic acid, in the latter, it is either nitrous gass or hydrogen. It is manifest, that the gass must have little or no affinity with the fluid in which it is immersed, in order to produce effervescence, hence it is, that although carbonic and muriatic acids are both gasses, and are both extricated from their alkaline combinations by sulphuric acid, yet a solution of carbonat of potash in water shall produce a vehement effervescence with sulphuric acid, while muriat of potash in the same circumstances shall occasion none at all, the carbonic acid having little or no affinity for water acidulated by sulphuric acid, while the muriatic acid will combine with the same very readily.

EFFE'TE. *a.* (*effœtus*, Latin.) 1. Disabled from generation (*Bentley*). 2. Worn out with age (*South*).

EFFICA'CIOUS. *a.* (*efficax*, Latin.) Productive of effects; powerful to produce the consequence intended (*Philips*).

EFFICA'CIOUSLY. *ad.* Effectually (*Digby*).

E FFICACY. *s.* (from *efficax*, Latin.) Production of the consequence intended (*Tillot.*).

EFFI'CIENCE. Effi'ciency. *s.* (from *efficio*, Latin.) The act of producing effects; agency (*South*).

EFFI'CIENT. *s.* (*efficiens*, Latin.) 1. The cause which makes effects to be what they are (*Hooker*). 2. He that makes; the effector (*Hale*). 3. A factor in multiplication (*Chambers*).

Efficient. *a.* Causing effect (*Collier*).

An efficient cause is either physical, as the fire is the efficient cause of heat; or moral, as an adviser is the cause of a murder; or universal, which in various circumstances produces various effects, as God and the sun; or particular, as a horse which produces a horse; or univocal, which produces an effect like itself, as a horse begets a horse; or equivocal, according to the old doctrine, as the sun producing a frog; or natural, which acts not only without precept in opposition to artificial, but also from within, and according to its own inclination, in opposition to violent, as fire acts when it warms; or spontaneous, as a dog eating; or voluntary and free.

To EFFI'GIATE. *v. a.* (*effigio*, Latin.) To form in semblance; to image.

EFFIGIA'TION. *s.* (from *effigiate.*) The act of imagining things or persons.

EFFI'GIES. E'ffigy. *s.* (*effigies*, Latin.) Resemblance; image in painting or sculpture; representation; idea (*Dryden*).

EFFLORESCENCE, (*efflorescentia*; from *effloresco*, to blow as a flower.) A preternatural redness of the skin. In chemistry it means that phænomenon which takes place upon crystals, producing a white powder, when exposed to air. Indeed, it is applied to two distinct phænomena, which it is of consequence to be aware of. Salts are either unalterable in the air, or they attract part of its moisture and are resolved into a fluid, or they yield part of their water of crystallization to the air, and are in consequence first superficially, and afterwards entirely, reduced to powder. This effect, at least in its commencement, is called efflorescence, and such salts are denominated efflorescent: but there is another kind of efflorescence wholly distinct from this, as when we speak of the efflorescence of iron pyrites or of new mortar; in these cases it implies the appearance of a superficial covering of minute hair-like crystals, and is occasioned by the chemical changes that take place on the surface of the substance where these crystals appear. Thus sulphuret of iron is changed by efflorescence into sulphat of iron or green vitriol: whereas sulphat of soda when subjected to the efflorescence first mentioned, although changed in form, remains the same in composition, except that it has lost part of its water. The one destroys crystals, the other produces them.

EFFLORE'SCENT. *a.* (*effloresco*, Latin.) Shooting out in form of flowers (*Woodward*).

EFFLORESCE'NTIA, is a term sometimes used by botanists, to denote the precise time of the year and month in which any plant shews its first flowers.

E'FFLUENCE. *s.* (*effluo*, Latin.) That which issues from some other principle (*Prior*).

EFFLUVIUM, (from *effluo*, to spread abroad.) In physiology, a term much used by philosophers and physicians, to express the minute particles which exhale from most, if not all, terrestrial bodies in the form of insensible vapours. Sometimes, indeed, these effluvia become visible, and are seen ascending in the form of smoke; constituting what, in animals and plants, makes the matter of perspiration.

Nothing can exceed the subtilty of the odoriferous effluvia of plants and other bodies. Mr. Boyle tells us, that having exposed to the open air a certain quantity of asafœtida, he found its weight diminished only the eighth part of a grain in six days: hence, if we suppose, that during all that time a man could smell the asafœtida at the distance of five feet, it will appear that its effluvia cannot exceed the [illegible] part of an inch in magnitude.

The effluvia of mineral substances are called steams; and when collected in mines, or other close places, damps. See GASS.

Malignant effluvia are assigned by physicians, as the cause of the plague and other contagious diseases; as the jail-distemper, hospital-fever, and the like. See CONTAGION and SEPTON.

E'FFLUX. *s.* (*effluxus*, Latin.) 1. The act of flowing out (*Harvey*). 2. Effusion; flow (*Hammond*). 3. That which flows from something else; emanation (*Thomson*).

To EFFLU'X. *v. n.* (*effluo*, Latin.) To run out; to flow away (*Boyle*).

EFFLU'XION. *s.* (*effluxum*, Latin.) 1. The act of flowing out (*Brown*). 2. That which flows out; effluvium; emanation (*Bacon*).

To EFFO'RCE. *v. a.* (*efforcer*, French.) Obsolete. 1. To break through by violence (*Spenser*). 2. To force; to ravish (*Spenser*).

To EFFO'RM. *v. a.* (*efformo*, Latin.) To shape; to fashion (*Taylor*).

EFFORMA'TION. *s.* (from *efform*.) The act of fashioning or giving form to (*Ray*).

E'FFORT. *s.* (*effort*, French.) Struggle; vehement action; laborious endeavour (*Addison*).

EFFO'SION. *s.* (*effodio*, Latin.) The act of digging up from the ground; deterration (*Arbuthnot*).

EFFRA'IABLE. *a.* (*effroyable*, French.) Dreadful; frightful: not used (*Harvey*).

EFFRO'NTERY. *s.* (*effronterie*, French.) Impudence; shamelessness (*K. Charles*).

EFFU'LGENCE. *s.* (*effulgeo*, Latin.) Lustre; brightness; clarity; splendour (*Milton*).

EFFU'LGENT. *a.* (*effulgens*, Lat.) Shining; bright; luminous (*Blackmore*).

EFFUMABI'LITY. *s.* (*fumus*, Latin.) The quality of flying away in fumes (*Boyle*).

To EFFU'SE. *v. a.* (*effusus*, Latin.) To pour out; to spill; to shed (*Milton*).

EFFU'SE. *s.* (from the verb.) Waste; effusion: not used (*Shakspeare*).

EFFU'SION. *s.* (*effusio*, Latin.) 1. The act of pouring out (*Taylor*). 2. Waste; the act of shedding (*Hooker*). 3. The act of pouring out words (*Hooker*). 4. Bounteous donation (*Hammond*). 5. The thing poured out (*King Charles*).

EFFU'SIVE. *a.* (from *effuse*.) Pouring out; dispersing (*Thomson*).

E FLAT, in music, the minor seventh of F, and the second flat introduced in modulating from the natural diatonic mode.

EFT, in amphibiology. See LACERTA.

EFT. *ad.* (eꝼꞇ, Saxon.) Soon; quickly; speedily; shortly: obsolete (*Fairfax*).

E'FTSOONS. *ad.* (eꝼꞇ and ꞅoon, Saxon.) Soon afterward: obsolete (*Knolles*).

E. G. (*exempli gratia*.) For the sake of an instance or example.

EGBERT, first king of England, and last of the Saxon heptarchy. He was the nephew of king Ina, and proclaimed king of Wessex in 800. In 828 he united all the other kingdoms under him. He distinguished himself greatly against the Danes, and governed with great wisdom and moderation. He died in 838, and was succeeded by his son Ethelwolf.

EGER. See EAGRE.

EGERIA, in fabulous history, a nymph of Aricia in Italy. She was courted by Numa, and according to Ovid, she became his wife. This prince frequently visited her, and that he might introduce his laws and new regulations into the state, he solemnly declared before the Roman people, that they were previously sanctified and approved by the nymph Egeria. Ovid says, that Egeria was so disconsolate at the death of Numa, that she melted into tears, and was changed into a fountain by Diana.

To EGE'ST. *v. a.* (*egero*, Latin.) To throw out food at the natural vents (*Bacon*).

EGE'STION. *s.* (*egestus*, Latin.) The act of throwing out the digested food (*Hale*).

EGG. *s.* (œᵹ, Saxon.) 1. That which is laid by feathered animals, and some others, from which their young is produced (*Bacon*). 2. The spawn or sperm (*Blackmore*). 3. Any thing fashioned in the shape of an egg (*Boyle*).

To EGG. *v. a.* (*eggin*, Islandick.) To incite; to instigate (*Derham*).

EGG. (*ovum*.) The shell or external covering of the embryo or fœtus of oviparous animals; for the physiological doctrine of which, see INCUBATION, OVATION, CONCEPTION, PHYSIOLOGY, and ORNITHOLOGY. The eggs of poultry are chiefly used as food: the different parts are likewise employed in pharmacy and in medicine. The calcined shell is esteemed as an absorbent.

The yolk consists of two parts, the one albuminous, resembling the pure albumen or white, and hence coagulable and hardened by heat, acids, and alcohol; and the other a mild fat oil, which appears to exist in the yolk as vegetable oil in the seeds of some plants, forming a striking analogy between the eggs of animals and the seeds of vegetables; and hence, well calculated for nutriment to the young chick. This oil is often applied externally and with success to burns and chaps.

The albumen, or white of the egg, is coagulable in the same manner as the serum of the blood, but with more facility. Upon chemical analysis it possesses the common properties and results of shell, quill, and nail. When left to itself, and exposed to a moist warm air, it progressively becomes thin and putrid, and then exhibits an urinary odour.

The shell is almost entirely carbonat of lime, cemented by secreted mucus. The lime is partly the result of the food taken into the stomach; but unquestionable experiments have also proved clearly, that a part of the lime is also secreted from the animal system of the hen or other fowl. These experiments have been made with much attention by Vauquelin, and the result has been always the same.

The fæces and urine of the cock, as well as of the hen, discover a solution of carbonat of lime: and hence it is not a vulgar prejudice alone that the cock himself has occasionally laid eggs, although eggs that, of course, have never been fecundated: for it is sufficient for this purpose, that a certain quantity of glair or albumen should loiter in the rectum for some time, and that the urine laden with carbonat of lime should pass over it, and give it a covering or tunic of this substance. The yolk of the egg renders oil miscible with water, and is triturated with the same view with resinous and other substances.

EGG, an ornament in architecture, whose name arises from its form. See ECHINUS.

EGG-PLANT. See SOLANUM.

EGG-SHAPED (Ovatus). In natural history. See OVATE.

EGLANDULOUS. In botany, applied to a petiole without glands.

EGLANTINE. In botany. See ROSA.

EGMONT (Justus van), an eminent painter, born at Leyden in 1602. He resided long in France, where he was appointed painter to the king, and one of the elders of the academy of painting and sculpture. He died at Antwerp in 1674. Egmont excelled in historical subjects.

E'GOTISM. *s.* (from *ego*, Latin.) The fault committed in writing by the frequent repetition of the word *ego*, or *I*; too frequent mention of one's self (*Spectator*).

E'GOTIST. *s.* (from *ego*, Latin.) One that is always repeating the word *ego*, *I*; a talker of himself (*Spectator*).

To E'GOTIZE. *v. n.* (from *ego*, Latin.) To talk much on one's self.

EGRA, a town of Bohemia, formerly imperial. It is seated on the Eger, and famous for its mineral waters. Lat. 50. 9 N. Lon. 12. 40 E.

EGRE'GIOUS. *a.* (*egregius*, Latin, from *e* ab *ex*, out of, and *grex*, *gregis*, a flock.) 1. One selected out of many for any distinguishing property. 2. Eminent; remarkable; extraordinary (*More*). 3. Eminently bad; remarkably vitious (*Pope*).

EGRE'GIOUSLY. *ad.* (from *egregious.*) Eminently; shamefully (*Arbuthnot*).

EGREMONT, a town in Cumberland, with a market on Saturdays. It is seated near the Irish Sea. Lat. 54. 32 N. Lon. 3. 35 W.

E'GRESS. *s.* (*egressus*, Latin.) The act of going out of any place; departure (*Woodward*).

EGRE'SSION. *s.* (*egressio*, Latin.) The act of going out (*Pope*).

EGRET. From *aigrette*, the French term for the pappus, down, or feathery crown of some seeds. See PAPPUS.

EGRET, in mastiology. See SIMIA.

EGRET, in ornithology. See ARDEA.

EGRIOT, a species of cherry. See PRUNUS.

EGUILLATTE, in the manage. See YERK.

EGYPT, a country of Africa; bounded on the north by the Mediterranean, on the east by the Red Sea and the isthmus of Suez, on the south by mountains, which separate it from Nubia, and on the west by the deserts of Lybia. Its length from north to south about 500 miles, its breadth about 160. Egypt is divided into Upper and Lower, the former extending in a long and narrow valley from Syene to Grand Cairo. Two ridges of mountains form the outlines of Upper Egypt, running along each side of the Nile, till, reaching Grand Cairo, the western ridge takes its course towards Alexandria, the other towards the Red Sea; the former consists of sandy hills, the base of which is a calcareous stone, the other of stony rocks. Beyond these mountains, on each side are deserts; between them lies a long plain, whose greatest breadth is not more than nine leagues. In this valley rolls the Nile. Lower Egypt includes all the country between Cairo and the Mediterranean on the north and south; and Lybia and the isthmus of Suez to the east and west; bounded by sandy deserts, it contains slips of land fertile and well cultivated on the borders of the river and canals, and in the centre, that tract which is called Delta, formed by the branches of the Nile. Some geographers divide Egypt into three parts, Upper, Middle, and Lower. The Upper Egypt was called by the Greeks Thebais, now Said, or al Said, which extends from Syene to Manfalout; Middle Egypt, called by the Greeks Heptanomis, now Vostani; and Lower Egypt, the best part of which was the Delta, now called Bahira, or Rif. The Thebais took its name from Thebes, the capital, and once contained many more cities; the other parts of Egypt contained a great number of magnificent and populous cities. The fertility of Egypt, and the excellence of its productions and fruits, are greatly celebrated by ancient writers, and by Moses himself, who must needs have been well acquainted with this country. It abounds in grain of all sorts, but particularly rice; insomuch, that, as it was formerly the granary of Rome while subject to the Roman empire, it is now the principal country which supplies Constantinople. The most plentiful parts of Egypt are the Delta, and that province which is now called Al Fayoum, supposed to be the ancient Heracleotic name, the capital of which, bearing the same name, is thought to have been either Heracleopolis, Nilopolis, or Arsinoe, and is said by the natives to have been built by Joseph, to whom they own themselves obliged for the improvements of this territory; which being much the lowest part of Egypt, was before nothing but a standing pool, till that patriarch, by cutting canals, and particularly the great one which reaches from the Nile to the lake Mœris, drained it of the water, and clearing it of the rushes and marshy weeds rendered it fit for tillage. It is now the most fertile and best cultivated land in the whole kingdom, containing a great number of villages, and yields grapes and other fruits in abundance; and it fails not bearing even in those years when the Nile not rising to its usual height occasions a scarcity in the other parts of Egypt. There are still eighty canals, like rivers, several of which are twenty, thirty, and forty leagues in length, receiving and distributing the inundation over the country. Except six, the others are almost all filled up, and are dry when the Nile is low. The grand lakes of Mœris, Bahira, and Mareotis, were vast reservoirs to contain the superabundant waters, and afterwards disperse them among the neighbouring plains. Besides these reservoirs, all the towns a little distance from the Nile are surrounded by spacious ponds, for the convenience of the inhabitants and agriculture. Twelve hundred years has this country been subjected to a people, who, not farmers themselves, have suffered these great works to perish, and the ignorance of its present government will complete their destruction. The limits of cultivated Egypt yearly decrease, and barren sands every where accumulate. When the Turks conquered Egypt, in 1517, the lake Mareotis was near the walls of Alexandria, and the canal through which its waters ran to that city was navigable. This lake has disappeared, and the lands it watered, which, according to historians, produced corn, wine, and fruits in abundance, are become deserts, where the melancholy traveller finds neither tree, shrub, nor verdure. The very canal, the work of Alexander, necessary for the subsistence of the city he had built, is almost filled up; it is dry except when the waters are at the highest point of inundation, and soon becomes so again. Population has equally suffered: ancient Egypt supplied food to eight millions of inhabitants, and to Italy and the neighbouring provinces likewise. At present, the estimate is not one half. Seed-time differs according to the province, and the height of the ground. Near Syene, wheat and barley are sown in October, and reaped in January. About Girge, the harvest month is February, and March round Grand Cairo: such is the general progress of the harvest through the Said. There are many exceptions, according as the lands are high or low, more or less distant from the river. They sow and reap all the year in Lower Egypt, wherever they can obtain the water of the river. The land is never fallow, and yields three harvests annually; there the traveller incessantly beholds the charming prospect of flowers, fruits, and corn; and spring, summer, and autumn, at once present their treasures. Descending from the cataracts, at the beginning of January, the wheat is seen almost ripe; farther on it is in ear; and still farther the fields are green. Lucerne is mowed three times between November and March, and is the only hay of Egypt, serving chiefly to fodder the cattle. The Egyptian art of hatching chickens is peculiar to themselves. Their manner of raising bees is not less extraordinary, and bespeaks great ingenuity. Upper Egypt preserving its verdure only four or five months, the flowers and harvest being seen no longer, the people of the Lower Egypt profit by this circumstance, assembling on board large boats the bees of different villages. Each proprietor confides his hives, with his own mark, to the boatman, who, when loaded, gently proceeds up the river, and stops at every place where he finds verdure and flowers. The bees swarm from their cells at break of day and collect their nectar, returning several times loaded with booty, and, in the evening, re-enter their hives, without ever mistaking their abode. Were heat the principle of diseases, the Said would not be habitable; but it only seems to occasion a burning fever, to which the inhabitants are subject, and which they cure by regimen, drinking much water, and bathing in the river; in other respects they are strong and healthy. Old men are numerous; and many ride on horseback at eighty. The food they eat in the hot season much contributes to the preservation of their health; it is chiefly vegetables, pulse, and milk. They bathe frequently, eat little, seldom drink fermented liquors, and mix much lemon juice in their food. This abstinence preserves vigour to a very advanced age. The waters of the Nile are lighter, softer, and more agreeable to the taste than almost any other. In Lower Egypt, the neighbourhood of the sea, the large lakes, and the abundance of the waters, moderate the sun's heat, and preserve a delightful temperature. The greatest torment of the inhabitants are the gnats and musquitos, which, rising by millions out of the marshes, swarm in the air and the houses. The handkerchief must be held in the hand all day. It is the first thing a visitor receives, and at night it is necessary to sleep under musquiteros. Diseases of the eyes are the commonest in Egypt, where the blind are numerous. Eight thousand of these unfortunate people are decently maintained in the great mosque of Grand Cairo. It is from this country that the English have, within a few years, imported that dreadful disorder, the ophthalmia. The small pox is very common in Egypt, without committing great ravages. As to pulmonary diseases, which in cold countries carry off so many in the prime of youth, they are unknown in this happy climate. The unhealthy season in Egypt is from February till the end of May; the south winds blow at intervals, and load the atmosphere with a subtile dust, which makes breathing difficult, and drive before them pernicious exhalations. Sometimes the heat becomes insupportable, and the thermometer suddenly rises twelve degrees.

Egypt was governed by its own kings till Cambyses became master of it 525 years B.C. This country continued under the Persian yoke till the time of Alexander the Great, who, having conquered Persia, built the city of Alexandria. He was succeeded by Ptolemy, the son of Lagus, 324 years B.C. Ten kings of that name succeeded each other, till Cleopatra, the sister of the last Ptolemy, ascended the throne; when Egypt became a Roman province, and continued so till the reign of Omar, the second calif of the successors of Mahomet, who drove away the Romans, after it had been in their hands 700 years. When the power of the califs declined, Saladine set up the empire of the Mamlouks, which became so powerful in time, that they extended their dominions over a great part of Africa, Syria, and Arabia. Last of all, Selim, a Turkish emperor, conquered Egypt. The present population of Egypt is computed at 3,300,000. The inhabitants are composed of four different races of people; the Turks, who pretend to be masters of the country; the Arabs, who were conquered by the Turks; the Cophts, who are descended from the first Egyptians that became Christians; and the Mamlouks, who were originally Circassian or Mingrelian slaves, but being the only military force, are the real masters of the country. Of these last, M. Volney observes, that during the 550 years they have been established in Egypt, not one of them has founded a subsisting family; not one family exists in the second generation; but all their children perish in the first or second year. The method of perpetuating them is the same as that by which they were established; that is, they are kept up by slaves transported from the original country. The Russians have, therefore, rendered a very important service to the Turks, by checking the traffic of slaves in Mount Caucasus. Egypt has been, for many years, distracted by the civil wars between the different contending beys, by which its 24 provinces were governed.

The animals found in Egypt are tigers, hyenas, antelopes, apes, camels, black cattle, horses, and asses; crocodiles, once thought peculiar to this country; camelions, ichneumons, ostriches, eagles, hawks, &c.

For a description of those stupendous and almost indestructible monuments of human grandeur, the pyramids, so often taken notice of by travellers, see the article PYRAMIDS.

EGYPTIAN PEBBLE. See JASPIS.

EGYPTIANS, or gypsies. See GYPSIES.

EHRENBREITSTEIN, a very ancient fortress, in the electorate of Treves, on the E. bank of the Rhine, opposite Coblentz. It stands on the summit of a stupendous rock, not less than 800 feet above the level of the river, and has been thought, when supported by a competent garrison, to be impregnable. This fortress, however, surrendered to the French, after a long siege, and a blockade of above a year's continuance, in Feb 1799. It has a communication with Coblentz, by subterraneous passages cut out of the solid rock, and is plentifully supplied with water from a well 280 feet deep.

EHRETIA. In botany, a genus of the class pentandria, order monogynia. Drupe two-celled; nuts solitary, two celled; stigma notched. Nine species; chiefly of the West Indies, and South America: generally shrubs: but e. tinifolia, a Jamaica tree; with alternate leaves, and white terminal flowers.

EHRHARTA. In botany, a genus of the class hexandria, order digynia. Calyx, glume two-valved, one flowered; corol, glume double, each of them two-valved, the outer one with a semilunar cavity on each side at the base for the reception of the inner one. Thirteen classes; all natives of the Cape: of these, four have lately been admitted into this genus upon the authority and elucidation of Dr. Swartz, which were heretofore more commonly ranged under the genus melica. Of these curious grasses, some species are awned, but the greater number awnless.

EIA, and EY, in our old writers are used for an island; sometimes for water: they generally have either one or other of these senses, when they terminate a word.

To EJA'CULATE. *v. a.* (*ejaculor*, Latin.) To throw; to shoot; to dart out (*Grew*).

EJACULA'TION. *s.* (from *ejaculate.*) 1. The act of darting or throwing out (*Bacon*). 1. A short prayer darted out occasionally (*Taylor*).

EJACULATORS, in anatomy, a name applied to two muscles of the penis, from their office in the ejection of the semen.

EJA'CULATORY. *a.* (from *ejaculate.*) 1. Suddenly darted out (*Duppa*). 2. Sudden; hasty (*L'Estrange*).

To EJE'CT. *v. a.* (*ejicio*, *ejectum*, Latin.) 1. To throw out; to cast forth; to void (*Sandys*). 2. To throw out or expel from an office or possession (*Dryden*). 3. To expel; to drive away (*Shakspeare*). 4. To cast away; to reject (*Hooker*).

EJE'CTION. *s.* (*ejectio*, Latin.) 1. The act of casting out; expulsion (*Broome*). 2. (In physick.) The discharge of any thing by an emunctory (*Quincy*).

EJECTMENT, in law, is a mixed action, by which a lessee for years, when ousted, may recover his term and damages; it is real in respect of the lands, but personal in respect of the damages. Since the disuse of real action, this mixed proceeding is become the common method of trying the title to lands or tenements. *Runn. on Ejectments.*

The modern method of proceeding in ejectment entirely depends on a string of legal fictions; no actual lease is made; no actual entry by the plaintiff; no actual ouster by the defendant; but all are merely ideal for the sole purpose of trying the title. To this end, a lease for a term of years is stated in the proceedings to have been made by him who claims title to the plaintiff, who is generally an ideal fictitious person, who has no existence, though it ought to be a real person to answer for the defendant's costs. In this proceeding, which is the declaration (for there is no other process in this action), it is also stated, that the lessee, in consequence of the demise to him made, entered into the premises; and that the defendant, who is also now another ideal fictitious person, and who is called the casual ejector, afterwards entered thereon, and ousted the plaintiff; for which ouster the plaintiff brings this action. Under this declaration is written a notice, supposed to be written by this casual ejector, directed to the tenant in possession of the premises; in which notice the casual ejector informs the tenant of the action brought by the lessee, and assures him, that as he, the casual ejector, has no title at all to the premises, he shall make no defence, and therefore he advises the tenant to appear in court, at a certain time, and defend his own title, otherwise he, the casual ejector, will suffer judgment to be had against him, by which the actual tenant will inevitably be turned out of possession. 2 Cromp. Prac. 152.

The ancient way of proceeding was by actual sealing a lease on the premises, by the party in interest who was to try the titles; and this method is still in use in the following cases:

First, Where the house or thing for which ejectment is brought is empty. Secondly, When a corporation is lessor of the plaintiff, they must give a letter of attorney to some person to enter and seal a lease on the land; for a corporation cannot make an attorney or a bailiff except by deed, nor can they appear but by making a proper person their attorney by deed, therefore they cannot enter and demise upon the land as natural persons can. *L. Raym.* 135. Thirdly, When the several interests of the lessor of the plaintiff are not known, for in that case it is proper to seal a lease on the premises, lest they should fail in setting out in their declaration the several interests which each man possesses. Fourthly, Where the proceedings are in an inferior court, they must proceed by actually sealing a lease, because they cannot make rules confess lease, entry, and ouster, inasmuch as inferior courts have not authority to imprison for disobedience to their rules.

It is a general rule, that no person can in any case bring an ejectment, unless he has in himself at the time a right of entry; for although by the modern practice the defendant is obliged by rule of court to confess lease, entry, and ouster, yet that rule was only designed to expedite the trial of the plaintiff's right, and not to give him a right which he had not before; and therefore, when it happens that the person claiming title to the lands has no right of entry, he cannot maintain his action. 3 *Black.* 206.

The damages recovered in these actions, though formerly their only intent, are now usually (since the title has been considered as the principal question) very small and inadequate, amounting commonly to one shilling, or some other trivial sum. In order, therefore, to complete the remedy, when the possession has been long detained from him that has right, an action of trespass also lies, after a recovery in ejectment, to recover the mesne profits which the tenant in possession had wrongfully received; which action may be brought in the name of either the nominal plaintiff in the ejectment, or his lessor, against the tenant in possession, whether he is made party to the ejectment, or suffers judgment to go by default.

EIGH *interj.* An expression of sudden delight.

EIGHT. *a.* (from the Saxon.) A number consisting of twice four.

EIGHTEEN. *a.* A number consisting of ten and eight units added together.

EIGHTEENTH. *a.* The order of a thing, either in place or succession, which is removed the distance of seventeen from the first; or twice as much or as far as the ninth.

EIGHTH. *a.* A word expressing the order in which a thing stands from the first, when it is next beyond the seventh.

EIGHTH, in music, an octave.

EIGHTIETH. *a.* An ordinal, implying that a thing or succession is removed eighty times, including the first.

EIGHT-PETALLED COROL, in botany, consisting of eight distinct petals. Octopetala corolla: as in mimusops. When it is only deeply divided into eight parts, it is said to be eight-cleft or octofid; (corolla octofida) as in fuchsia and chlora. We have an example of an eight-cleft calyx (calyx octofidus) in tormentilla.

EIGHT-SCORE. *a.* Eight times twenty, or 160.

EIGHTY. *s.* A number consisting of eight times ten added together.

EIGNE. *a.* (*aisne*, French.) In law, the elder, or first-born; not alienable; entailed.

EILE'MA. (ειλημα; from ειλεω, to involve: q. d. involution.) Contortion or involution of the eileum or ileum: iliac passion.

EI'LEUM. (ειλεον; from ειλεω, to involve.) The ileum; so called from its many circumvolutions.

EILEUS. (from the theme above.) The same as eilema, iliac passion.

EI'SEL. *s.* (eosil, Saxon.) Vinegar; any acid.

EISETERIA. (from εισειμα, I enter.) In antiquity, the day on which the magistrates at Athens entered upon their office.

EI'THER. *pron.* (æȝðeꞃ, Saxon.) One or other of two persons or things indifferently. 2. Each; both (*Hale*).

EI'THER. *ad.* A distributive adverb, answered by *or*: *either* the one *or* the other (*Bacon*).

EJULA'TION. *s.* (*ejulatio*, Lat.) Outcry; lamentation; moan; wailing (*G. of the Ton.*).

EKE. *ad.* (eac, Saxon.) Also; likewise (*Prior*).

To EKE. *v. a.* (eacan, Saxon.) 1. To increase (*Spenser*). 2. To supply; to fill up deficiencies (*Pope*). 3. To protract; to lengthen (*Shakspeare*). 4. To spin out by useless additions (*Pope*).

EKEBIRGIA, in botany, a genus of the class decandria, order monogynia. Calyx four-parted; corol five-petalled; nectary a ring surrounding the germ; berry five-seeded. One species only; a Cape tree with pinnate leaves; leaflets ovate, lanceolate, entire; panicle axillary, corymbed; pedicels and calyxes woolly.

EKLYSIS, in ancient music, a particular kind of tuning in the enharmonic genus; in which the performer dropped from a certain sound to one that was lower by three quarter tones.

EKRON, in scripture history, a city and government of the Philistines.

To **ELA'BORATE.** *v. a.* (*elaboro*, Latin.) 1. To produce with labour (*Young*). 2. To heighten and improve by successive endeavours or operations (*Arbuthnot*).

ELA'BORATE. *a.* (*elaboratus*, Latin.) Finished with great diligence (*Waller*).

ELA'BORATELY. *ad.* Laboriously; diligently; with great study (*Newton*).

ELABORA'TION. *s.* (from *elaborate.*) Improvement by successive operations (*Ray*).

ELÆAGNUS. Oleaster, or wild olive. In botany, a genus of the class tetrandria, order monogynia. Corolless; calyx four-cleft, campanulate, superior; drupe beneath the calyx. Ten species; one or two from the south of Europe: the rest from India. Those more frequently cultivated among ourselves are,

1. E. orientalis, with oblong, ovate, opake leaves, paler underneath, but not glossy or silvery: flowers small, yellowish in the inside, and not unpleasantly scented when fully blown.

2. E. angustifolia: with lanceolate leaves, silvery white underneath. It is sometimes a thorny tree: very beautiful both in leaves and flower, and chiefly cultivated in our gardens.

3. E. latifola: with ovate, alternate leaves, elegantly silvered, and varigated with dark-coloured spots. It is a native of Ceylon.

The last species is too tender to be exposed to the changeful climate of this country, and must therefore always be treated as a green-house or a stove plant. The two former species are best propagated by laying down the young shoots in autumn: in a twelvemonth after which they will take root and may be separated from the parent stock, and transplanted to the places for which they are intended.

ELÆOCARPUS, in botany, a genus of the class polyandria, order monogynia. Calyx five-leaved, or five parted; petals five, jagged; anthers two-valved at the tip; drupe with a grooved and tubercled nut. Five species; trees of India or New Zealand: of which e. copallifera, with leaves very entire and terminal panicle, yields the resin called Gum Copal, so frequently employed in our varnishes.

ELÆOTHESIUM, in antiquity, the same as alipterium.

To **ELA'NCE.** *v. a.* (*elancer*, French.) To throw out; to dart (*Prior*).

ELAPHEBOLIA, an ancient festival in honour of Diana the huntress.

ELAPHEBOLIUM, the ninth month of the Athenian year, answering to the latter part of February and beginning of March. It contained 30 days, and took its name from the festival Ebolia which was celebrated in that month.

ELAPHOBOSCUM. (*elaphoboscum*, ελαφοϐοσκον; from ελαφος, a stag, and βοσκω, to eat; so called, because deer eat them greedily.) The wild parsnip. See PASTINACA.

ELAPHRUS, in zoology, a tribe of coleopterous insects belonging to the genus cicindela thus denominated by Fabricius in his entomological system. See CICINDELA.

ELASMIS. See TALC.

To **ELA'PSE.** *v. a.* (*elapsus*, Lat.) To pass away; to glide away (*Clarissa*).

ELA'STICAL. ELASTIC. *a.* (from ελαω.) Having the power of returning to the form from which it was distorted; springy; having the power of a spring (*Newton*).

ELASTIC BITUMEN. See BITUMEN.

ELASTIC FLUIDS. See AIR, GASS, and VAPOURS.

ELASTIC GUM. See CAOUTCHOUC.

ELASTIC PERICARP, in botany, throwing open, or casting off its valves with a spring, as in dictamnus albus. Not different from DISSILIENT; which see.

ELASTIC STRINGS, such as possess the property of restoring themselves to the figure and position which they had lost by the action of some other body upon them. Strings of catgut and of gold, brass, and silver wire, are generally denominated elastic, and indeed have the term applied to them with more propriety than any other strings we are acquainted with: on this account they are made use of in the construction of musical stringed instruments. Mathematicians have endeavoured to investigate the nature of the curve into which a vibrating elastic string would form itself at any period of its vibration. The theorem of Euler and De La Grange, in the case where the stretched string is supposed to be first at rest, is in effect this: continue the figure each way alternately on different sides of the axis, and in contrary positions; then, from any point of the curve, take an abscis each way, in the same proportion to the length of the chord as any given portion of time bears to the time of one semivibration, and the half sum of the ordinates will be the distance of that point of the string from the axis, at the expiration of the time given. Experiments have fully proved the accuracy of this construction, and the non-existence of what has been called the harmonical curve. Dr. Thomas Young, in part I. Phil. Trans. 1800, has given an entertaining account of the multifarious figures of musical strings, according to the different ways in which they are put in motion; wherein he observes, that when a string is of unequal thickness, or when it is loosely tended and forcibly inflected, the apsides and double points of the orbits have a very evident rotatory motion. The compound rotations seem to demonstrate the existence of secondary vibrations, and to account for the acute harmonic sounds which generally attend the fundamental sound. This gentleman also remarks, that, "there is one fact respecting these secondary notes which seems entirely to have escaped notice. If a chord be inflected at one-half, one-third, or any other aliquot part of its length, and then suddenly left at liberty, the harmonic note which would be produced by dividing the chord at that point is entirely lost, and is not to be distinguished during any part of the continuance of the sound. This demonstrates, that the secondary notes do not depend upon any interference of the vibrations of the air with each other, nor upon any sympathetic agitation of auditory fibres, nor upon any effect of reflected sound upon the chord, but merely upon its initial figure and motion. See CHORD, HARMONICS, and STRING.

ELASTICITY, that disposition in bodies by which they endeavour to restore themselves to the posture from whence they were displaced by any external force. The principal phenomena observable in elastic bodies are: 1. That an elastic body (*i. e.* a body perfectly elastic, if any such there be) endeavours to restore itself with the same force with which it is pressed or bent. 2. An elastic body exerts its force equally towards all sides; though the effect is chiefly found on that side where the resistance is weakest, as is evident in the case of a gun exploding a ball, a bow shooting out an arrow, &c. 3. Elastic bodies, in what manner soever struck, or impelled, are inflected, and rebound after the same manner: thus a bell yields the same musical sound, in what manner or on what side soever it be struck; the same of a tense or musical chord: and a body rebounds from a plane in the same angle in which it meets or strikes it, making the angle of incidence equal to the angle of reflection, whether the intensity of the stroke be greater or less. 4. A body perfectly liquid, if any such there be, cannot be elastic, if it be allowed that its parts cannot be compressed. 5. A body perfectly solid, if any such there be, cannot be elastic; because, having no pores, it is incapable of being compressed. 6. The elastic properties of bodies seem to differ, according to their greater or less density or compactness, though not in an equal degree: thus, metals are rendered more compact and elastic by being hammered: tempered steel is much more elastic than soft steel; and the density of the former is to that of the latter as 7809 to 7738: cold condenses solid bodies, and renders them more elastic; whilst heat, that relaxes them, has the opposite effect: but, on the contrary, air, and other elastic fluids, are expanded by heat, and rendered more elastic.

Some bodies are almost perfectly elastic, that is, when their shape is changed by external pressure, and that pressure is removed, they recover their former shape completely, and they recover it with great promptitude. Glass, ivory, hard steel, are of this kind. But most bodies either do not recover it completely, or they recover it very slowly; some hardly recover it at all. A rod of iron will, when considerably bent, not nearly recover its shape; a rod of lead still less; and a rod of soft clay will hardly recover it in any degree. These, however, are but gradations of one and the same quality: if the quiescent form of a body is very little disturbed, it will recover it again. Thus, a common soft iron wire of N° 6. and 12 inches long, if twisted once round, will return completely to its original form, and will allow this to be repeated for ever; but if it be twisted $1\frac{1}{2}$ turns, it will untwist only 1: and in this new form, it will twist and untwist one turn as often as we please. Even a rod of soft clay $\frac{1}{10}$th of an inch in diameter, and 7 feet long, will bear one twist as often as we please; but if twisted 4 times, will untwist itself only one turn, and will do this as often as we choose. In short, it appears that the particles of bodies, usually called unelastic, will admit a small change of distance or situation, and will recover it again, exhibiting perfect elasticity, in opposition to very small forces; but if they are forced too far from this situation, they have no tendency to return to it completely, but find intermediate situations, in which they have the very same connections with the surrounding particles; and in this new situation, they can again exhibit the same perfect elasticity, in opposition to very small forces. Mr. Coulomb conceives such bodies to consist of elastic particles: they manifest perfect elasticity, so long as the forces employed to change their shape do not remove the particles from their present contacts; but if they are removed from these, they slide on to other situations, where they again exhibit the same appearances.

If two bodies perfectly elastic strike one against another, there will be or remain in each the same relative velocity as before, *i. e.* they will recede with the same velocity as that with which they met. For the compressive force, or the magnitude of the stroke in any given bodies, arises from the relative velocity of those bodies, and is proportional to it; and bodies perfectly elastic will restore themselves completely to the figure they had before the shock; or, in other words, the restitutive force is equal to the compressive, and therefore must be equal to the force with which they came together, and consequently they must by elasticity recede from each other with the same velocity. Hence, taking equal times before and after the shock, the distances between the bodies will be equal: and therefore the distances of times from the common centre of gravity will, in the same times, be equal. Whence the laws of percussion of bodies perfectly elastic are easily deduced.

The cause or principle of elasticity has been variously assigned. The Cartesians account for it from the materia subtilis making an effort to pass through pores that are too narrow for it. But others, setting aside the precarious notion of a materia subtilis, account for elasticity from that great law of nature *attraction*, or the cause of the cohesion of the parts of solid and firm bodies. Thus, say they, when a hard body is struck or bent, so that the component parts are moved a little from each other, but not quite disjointed or broke off, or separated so far as to be out of the power of that attracting force whereby they cohere; they must certainly, on the cessation of the external violence, spring back to their former natural state. Others resolve elasticity into the pressure of the atmosphere: for a violent tension, or compression, though not so great as to separate the constituent particles of bodies far enough to let in any foreign matter, must yet occasion many little vacuola between the separated surfaces; so that upon the removal of the force they will close again by the pressure of the aërial fluid upon the external parts. (See ATMOSPHERE.) Lastly, others attribute the elasticity of all hard bodies to the power of resilition in the air included within them; and so make the elastic force of the air the principle of elasticity in all other bodies. But all these explications are unsatisfactory.

M. Libes, the ingenious author of the Nouveau Dictionnaire de Physique, has given at p. 341, &c. of his first volume, a new explication of the phenomena of elasticity, which depends upon the following principles:

1. The signs of elasticity suppose a compression effected, that is, an alteration in the figure of bodies produced by the mutual approach of the moleculæ: whence it results, that bodies, whose moleculæ yield with a very great facility to the slightest pressure, so as to roll one over another without changing their figure, cannot give sensible signs of elasticity. Such in general are liquids.

2. When an elastic body is compressed, some of its integrant moleculæ are brought nearer to one another, while others undergo a farther separation nearly equal to the approach of the former.

3. At the habitual degree of heat and pressure which we experience, all bodies have a volume determined by the ratio of equality, which exists between the attractive force of their particles, and the repulsive force communicated by the caloric combined with those particles.

These being granted, the re-establishment of solid bodies, after the compression, appears to be the result of the combined action of the caloric and of attraction. For in the moleculæ brought nearer by the compression, the repulsive force augments, and the attractive force likewise augments; but the augmentation of the former force exceeds that of the latter. For, at the epoch of the formation of the body, such as it existed previous to the compression, the repulsive force communicated to its moleculæ by the caloric was sufficient to give the degree of separation that was peculiar to the body: it was, therefore, superior to the attractive force until the moment when the moleculæ had become so far separated as was consistent with the natural state of the body. Whence it results, that if the particles are brought nearer together by compression, that is, if they are contracted with the caloric into a smaller space, the ratio of equality which subsisted between the attraction and the repulsion before the compression, must be destroyed in favour of the repulsion; and consequently, on the cessation of the compression, this surplus of repulsive force will act so as to separate again the moleculæ brought nearer by the compression until the equilibrium is re-established between the attraction and the repulsion: and this equilibrium can only be re-established, when the molecules have recovered the degree of separation which they had previous to the compression.

For similar reasons the attraction will predominate over the repulsion in those particles which have suffered a farther separation than is due to the natural state: it must, therefore, act to draw the particles nearer, and re-establish the equilibrium of those forces: and this equilibrium cannot be re-established until the molecules have recovered the relative distance which they had before the compression.

This theory M. Libes applies to an elastic sphere, as an ivory ball when falling upon a plane, to a plate of steel, whose extremities are brought towards each other by bending, and to the known effects of tempered metals, &c.

In explaining the elasticity of aeriform fluids, M. Libes calls in to his aid a new force. For, in this kind of substances, the repulsion having prevailed over the attraction, their particles are retained in their mutual position by the pressure of the atmosphere. But this force, it may be observed, being constant, makes no change in the results just stated: except that if the pressure be taken away, the particles of the gas will be separated from one another, until their relative distance attains a point determined by the equality between the attraction of the earth, and the repulsion of those particles.

Now since all bodies contain caloric, it may be asked how it happens that all bodies are not elastic, if caloric be the principle of elasticity? To this M. Libes replies by the following remarks.

1st. Since there is not in nature any body, either perfectly hard, or perfectly soft, there is none but what possesses some degree of elasticity.

2dly. Perceptible signs of elasticity suppose the compression effected: it is not therefore surprising, that bodies in which we cannot produce compression should not give any sign of elasticity.

3dly. Although caloric be the principle of elasticity, it does not follow that all bodies which contain caloric must exhibit this property. 1. Too much or too little caloric may equally weaken the elastic force. The different forms which distinguish the integrant moleculæ of different bodies, the different arrangement assumed by those moleculæ, according to circumstances, may be sometimes more or less favourable, at others more or less prejudicial to elasticity. 2. Soft bodies, such as butter, humid clay, &c. experience in their soft state a commencement of solution by water, which must alter the repulsive force of their moleculæ, and consequently hurt the elasticity. This is so true, that these bodies, freed from their aqueous part, without changing their temperature yield sensible signs of elasticity.

M. Libes, instead of attempting to explain, as some would expect, why caloric is elastic, says it is not necessary to suppose it so. For it may communicate this property to other bodies without being so itself. This position he illustrates as follows: when dry bread is immersed in water, that bread becomes swoln, its particles being farther separated from one another: water, therefore, by penetrating the pores of the bread, communicates to its particles a repulsive force; yet it would be ridiculous to conclude from hence, that the moleculæ of water mutually repel one another. In like manner, when we subject a body to the action of heat, its integrant molecules are separated from one another, and acquire a repulsive force by their combination with caloric: but this phenomenon, like the preceding, probably depends upon the concourse of several attractive forces, such as that of the moleculæ of the caloric, that of the particles of the body for one another, and lastly the reciprocal attraction of the particles of the caloric and those of the body penetrated by that fluid; whence it results that the elasticity of bodies by no means presupposes that of the caloric which has given rise to it.

Indeed, M. Libes does not regard as completely demonstrated the existence of the fluid called caloric, he assumes the hypothesis as a matter of convenience, which enables us to abridge the language of philosophical discussions, and to found upon our reasonings an analytical calculus. He next, therefore, proceeds to state his theory analytically; and deduces from his formulæ the following results among others. 1. That when we compress elastic fluids, the repulsive force becomes more powerful than the attractive, and consequently when the compression ceases, the moleculæ ought to return towards their first position. 2. That liquids and aeriform fluids have the exclusive privilege of assuming a larger volume when the pressure of the atmosphere is taken away. (*Dict. de Phys. Retrospect, No.* 8.)

ELASTICITY OF THE AIR. See AIR and PNEUMATICS.

ELA'TE. *a.* (*elatus*, Latin.) Flushed, puffed up, or haughty, on account of success.

To **ELA'TE.** *v. a.* To puff up; to make one proud with praise, prosperity, or success; to exalt or heighten.

ELATE, in botany, a genus of the class monoecia, order triandria. Male; calyx three-toothed; corol three-petalled; anthers six, sessile. Female; calyx one-leafed; corol three-petalled; pistil one; stigmas three; drupe one-seeded. One species only: an Indian palm, about fourteen feet high, the nut of which is chewed by the natives as the areca or betel-leaf.

ELATER, in zoology, a genus of the class insecta, order coleoptera. Antennas filiform, lodged in a groove under the head and thorax terminating in an elastic spine placed in a cavity of the abdomen; by which means the body, when placed on the back, springs up and recovers its natural posture. A hundred and eighty-three species, inhabiting the four quarters of the globe; and about thirty found in our own country, most commonly in our gardens; these are generally of a dun, dusky or black hue. They may be conveniently divided into the following tribes or subtribes.

A. Feelers hatchet-shaped, which includes nearly the whole.

B. Feelers clavate, the club round; which includes the Fabrician tribe parnus.

Many of these insects are phosporescent, and are thence specifically denominated noctilucens, phosphoræus, ignitus, fulgens, &c. Of all these noctilucens is the most curious, which is specifically distinguished by a glabrous yellow spot on the sides of the thorax. This insect affords a phosphorescent light in the night time, the streams of which are so strong that a person may see to read the smallest print by it. When placed on its back, moreover, it will spring four or five inches from the level on which it is put to recover its natural position. See Nat. Hist. Pl. LXXXVII.

ELATERIUM, in botany, a species of momordica, of the monoecia monandria class and order. Natural order of cucurbitaceæ. Essential character: Male, calyxless; corol salver-shaped. Female, calyxless; corol salver-shaped; capsule inferior, one-celled, two-valved. See MOMORDICA.

ELATERIUM, in pharmacy, a violently purgative medicine, prepared from the above.

ELATINE. Water-wort. In botany, a genus of the class octandria, order tetragynia. Calyx four-leaved; petals four; capsule superior, four-celled, four-valved, many seeded; the partitions opposite to the fissures. Two species; aquatic annuals of Europe, and one of them, e. hydropiper, with opposite leaves, common to the ditches of our own country.

ELATINE. (*elatine*, ελατινη; from ελαῖτων, smaller, being the smaller species.) Fluellen. Female speedwell. Antirrhinum elatine of Linnéus. The leaves of this plant have a roughish bitter taste, but no smell. It was formerly much used against scurvy and old ulcerations, but now wholly forgotten. See ANTIRRHINUM.

ELA'TION. *s.* (from *elate.*) Haughtiness proceeding from success (*Atterbury*).

ELBE, a large river of Germany, which rises in the Mountain of the Giants, on the confines of Bohemia and Silesia. After passing by Koningsgratz, Dresden, Magdeburgh, &c. it falls into the German ocean a little below the fortress of Gluckstadt.

ELBING, a town of Marienburg, in Regal Prussia. It is subject to Poland, and is 30 miles S.E. of Dantzic. Lat. 54. 9 N. Lon. 19. 35 E.

E'LBOW. *s.* (elboʒa, Saxon.) 1. The next joint or curvature of the arm below the shoulder (*Pope*). 2. Any flexure, or angle (*Bacon*). 3. *To be at the* ELBOW. To be near (*Shakspeare*).

To **E'LBOW.** *v. n.* (from the noun.) 1. To push with the elbow (*Dryden*). 2. To push; to drive to a distance (*Dryden*).

To **E'LBOW.** *v. n.* To jut out in angles.

ELBOW, or CUBIT OF A HORSE; the hind part of the arm that points towards the sternum.

E'LBOWCHAIR. *s.* (*elbow* and *chair.*) A chair with arms to support the elbows (*Gay*).

E'LBOWROOM. *s.* Room to stretch out the elbows; freedom from confinement (*South*).

ELCESAITES, in church-history, a sect who made their appearance in the reign of the emperor Trajan, and took their name from their leader Elcesai. The Elcesaites keep a mean between the Jews, Christians, and Pagans; they worshipped but one God, observed the Jewish sabbath, circumcision, and the other ceremonies of the law. They rejected the Pentateuch and the Prophets: nor had they more respect for the writings of the apostles, particularly those of St. Paul.

ELCOSIS. (*elcosis*, ελκωσις; from ελκος, an ulcer.) A disease attended with fetid, carious, and chronic ulcers. The term is seldom used.

ELDER TREE. See Sambucus.

Elder (Dwarf). See Sambucus.

Elder *a.* (the comparative of *eld*, now obsolete.) One who surpasses another in years; one who is born before, or one who survives another.

E'LDERS. *s. plur.* 1. Persons whose ages give them a claim to reverence (*Sandys*). 2. Ancestors (*Pope*). 3. Those who are older than others (*Hooker*).

Elders, among the Jews, were persons of great age, experience, and wisdom: the denomination is known in the Presbyterian discipline. They are officers who, with the ministers and deacons, compose the sessions of the kirk. The elder's business is to assist the minister in visiting the congregation upon occasion, to watch over the morals of the people of his district, and to give them private reproof in case of any disorder; but if the scandal be gross, or the person obstinate, he lays the thing before the session. The elders are chosen from among the most substantial, knowing and regular people, by the session or consistory of the kirk. There is an indefinite number of elders in each parish; generally about twelve. There is a ruling elder in every session: he should be a man of spotless character, and of principal consideration and interest in his parish; he is chosen out of the kirk session: the congregation is to approve of the choice: the minister ordains him before the congregation: he may be chosen to assist in any church judicatory, and in all manner of government and discipline has an equal vote with the minister.

E'LDERSHIP. *s.* (from *elder.*) 1. Seniority; primogeniture (*Rowe*). 2. Presbytery; ecclesiastical senate (*Hooker*).

E'LDEST. *a.* (The superlative of *old.*) 1. The oldest; that has the right of primogeniture (*Shakspeare*). 2. That has lived most years (*Locke*).

ELEATIC PHILOSOPHY, among the ancients, a name given to that of the Stoics, because taught at 'Ελεα, in Latin, Velia, a town of the Lucani.

The founder of this philosophy, or of the Eleatic sect, is supposed to have been Xenophanes, who lived about the fifty-sixth Olympiad, or between five and six hundred years before Christ. This sect was divided into two parties, which may be denominated metaphysical and physical; the one rejecting, and the other approving, the appeal to fact and experiment. Of the former kind were Xenophanes, Parmenides, Melissus, and Zeno, of Elea. They are supposed to have maintained principles not very unlike those of Spinoza; they held the eternity and immutability of the world; that whatever existed was only one being; that there was neither any generation nor corruption; that this one being was immoveable and immutable, and was the true God; and whatever changes seemed to happen in the universe, they considered as mere appearances and illusions of sense. The other branch of the Eleatic sect were the atomic philosophers, who formed their system from an attention to the phenomena of nature; of these the most considerable were Leucippus, Democritus, and Protagoras. See Epicureans, and Stoics.

ELECAMPANE, in botany. See Inula.

To ELE'CT. *v. a.* (*electus*, Latin.) 1. To choose for an office or use (*Daniel*). 2. (In theology.) To select as an object of eternal mercy (*Milton*).

Ele'ct. *a.* (from the verb.) 1. Chosen; taken by preference from among others (*Shakspeare*). 2. Chosen to an office, not yet in possession (*Ayliffe*). 3. (In theology.) Chosen as an object of eternal mercy (*Hammond*).

ELE'CTION. *s.* (*electio*, Latin.) 1. The act of choosing; choice (*Whitgift*). 2. The power of choice (*Davies*). 3. Voluntary preference (*Rogers*). 4. Discernment; distinction (*Bacon*). 5. The determination of God by which any were selected for eternal life (*Atterbury*). 6. The ceremony of a public choice (*Addison*).

There seems this difference, however, between choice and election, that election has usually a regard to a company or community, which makes the choice; whereas choice is seldom used but when a single person makes it.

Election, in British polity, is the people's choice of their representatives in parliament. (See Parliament.) In this consists the exercise of the democratical part of our constitution: for in a democracy there can be no exercise of sovereignty but by suffrage, which is the declaration of the people's will. In all democracies, therefore, it is of the utmost importance to regulate by whom, and in what manner, the suffrages are to be given. And the Athenians were so justly jealous of this prerogative, that a stranger who interfered in the assemblies of the people was punished by their laws with death; because such a man was esteemed guilty of high treason, by usurping those rights of sovereignty to which he had no title. In Britain, says Blackstone, where the people do not debate in a collective body, but by representation, the exercise of this sovereignty consists in the choice of representatives. The laws have therefore very strictly guarded against usurpation or abuse of this power, by many salutary provisions; which may be reduced to these three points, 1. The qualifications of the electors. 2. The qualifications of the elected. 3. The proceedings at elections.

1. As to the qualifications of the electors. The true reason of requiring any qualification,

with regard to property, in votes, is to exclude such persons as are in so mean a situation, that they are esteemed to have no will of their own. If these persons had votes, they would be tempted to dispose of them under some undue influence or other. This would give a great, an artful, or a wealthy man a larger share in elections than is consistent with general liberty. If it were probable that every man would give his vote freely, and without influence of any kind; then, upon the true theory and genuine principles of liberty, every member of the community, however poor, should have a vote in electing those delegates to whose charge is committed the disposal of his property, his liberty, and his life. But since that can hardly be expected in persons of indigent fortunes, or such as are under the immediate dominion of others, all popular states have been obliged to establish certain qualifications; whereby some, who are suspected to have no will of their own, are excluded from voting, in order to set other individuals, whose will may be supposed independent, more thoroughly upon a level with each other.

And this constitution of suffrages is framed upon a wiser principle with us, than either of the methods of voting, by centuries or by tribes, among the Romans. In the method by centuries, instituted by Servius Tullius, it was principally property, and not numbers, that turned the scale: in the method by tribes, gradually introduced by the tribunes of the people, numbers only were regarded, and property entirely overlooked. Hence the laws passed by the former method had usually too great a tendency to aggrandize the patricians or rich nobles: and those by the latter had too much of a levelling principle. Our constitution steers between the two extremes. Only such are entirely excluded as can have no will of their own: there is hardly a free agent to be found, but what is entitled to a vote in some place or other in the kingdom. Nor is comparative wealth, or property, entirely disregarded in elections; for though the richest man has only one vote at one place, yet, if his property be at all diffused, he has probably a right to vote at more places than one, and therefore has many representatives. This is the spirit of our constitution: not that we assert it is in fact quite so perfect as we have endeavoured to describe it; for if any alteration might be wished or suggested in the present form of parliaments, it should be in favour of a more complete representation of the people.

But to return to the qualifications; and first those of electors for knights of the shire. 1. By statute 8 Hen. VI. c. 7. and 10 Hen. VI. c. 2. (amended by 14 Geo. 3. c. 58.) the knights of the shire shall be chosen of people, whereof every man shall have freehold to the value of 40 shillings by the year within the county; which (by subsequent statutes) is to be clear of all charges and deductions, except parliamentary and parochial taxes. The knights of shires are the representatives of the landholders, or landed interest of the kingdom: their electors must therefore have estates in lands or tenements within the county represented. These estates must be freehold, that is, for term of life at least; because beneficial leases for long terms of years were not in use at the making of these statutes, and copyholders were then little better than villeins, absolutely dependent upon their lords. This freehold must be of forty shillings annual value; because that sum would then, with proper industry, furnish all the necessaries of life, and render the freeholder, if he pleased, an independent man: For bishop Fleetwood, in his Chronicon Preciosum, written at the beginning of the present century, has fully proved 40 shillings in the reign of Henry VI. to have been equal to 12 pounds per annum in the reign of queen Anne; and, as the value of money is very considerably lowered since the bishop wrote, we may fairly conclude, from this and other circumstances, that what was equivalent to 12 pounds in his days, is equivalent to 20 at present. The other less important qualifications of the electors for counties in England and Wales may be collected from statutes 7 and 8 Will. III. c. 25. 10 Ann. c. 23. 2 Geo. II. c. 21. 18 Geo. II. c. 18. 31 Geo. II. c. 14. 3 Geo. III. c. 24. which direct, 2. That no person under 21 years of age shall be capable of voting for any member. This extends to all sorts of members as well for boroughs as counties; as does also the next, viz. 3. That no person convicted of perjury, or subornation of perjury, shall be capable of voting in any election. 4. That no person shall vote in right of any freehold, granted to him fraudulently to qualify him to vote. Fraudulent grants are such as contain an agreement to reconvey, or to defeat the estate granted; which agreements are made void, and the estate is absolutely vested in the person to whom it is so granted. And, to guard the better against such frauds, it is farther provided, 5. That every voter shall have been in the actual possession, or receipt of the profits, of his freehold to his own use for 12 kalendar months before; except it came to him by descent, marriage, marriage-settlement, will, or promotion to a benefice or office. 6. That no person shall vote in respect of an annuity or rent-charge, unless registered with the clerk of the peace 12 kalendar months before. 7. That in mortgaged or trust-estates, the person in possession, under the abovementioned restrictions, shall have the vote. 8. That only one person shall be admitted to vote for any one house or tenement, to prevent the splitting of freeholds. 9. That no estate shall qualify a voter, unless the estate has been assessed to some land-tax aid, at least 12 months before the election. 10. That no tenant by copy of court-roll shall be permitted to vote as a freeholder. Thus much for the electors in counties.

As for the electors of citizens and burgesses, these are supposed to be the mercantile part or trading interest of the kingdom. But as trade is of a fluctuating nature, and seldom long fixed in a place, it was formerly left to the crown to summon, *pro re nata*, the most flourishing towns to send representatives to parliament. So that as towns increased in trade, and grew populous, they were admitted to a share in the legislature. But the misfortune is, that the deserted boroughs continued to be summoned, as well as those to whom their trade and inhabitants were transferred; except a few, which petitioned to be eased of the expence, then usual, of maintaining their members; four shillings a-day being allowed for a knight of the shire, and two shillings for a citizen or burgess; which was the rate of wages established in the reign of Edward III. Hence the members for boroughs now bear above a quadruple proportion to those for counties; and the number of parliament men is increased since Fortescue's time, in the reign of Henry VI. from 300 to above 500, exclusive of those for Scotland. The universities were, in general, not empowered to send burgesses to parliament; though once, in 28 Edw. I. when a parliament was summoned to consider of the king's right to Scotland, there were issued writs, which required the university of Oxford to send up four or five, and that of Cambridge two or three, of their most discreet and learned lawyers for that purpose. But it was king James I. who indulged them with the permanent privilege to send constantly two of their own body; to serve for those students who, though useful members of the community, were neither concerned in the landed nor the trading interest; and to protect in the legislature the rights of the republic of letters. The right of election in boroughs is various, depending entirely on the several charters, customs, and constitutions of the respective places; which has occasioned infinite disputes: though now, by statute 2 Geo. II. c. 24. the right of voting for the future shall be allowed according to the last determination of the house of commons concerning it; and, by statute 3 Geo. III. c. 15. no freeman of any city or borough (other than such as claim by birth, marriage, or servitude) shall be intitled to vote therein, unless he hath been admitted to his freedom 12 kalendar months before.

2. Next, as to the qualifications of persons to be elected members of the house of commons. Some of these depend upon the law and custom of parliament, declared by the house of commons; others upon certain statutes. And from these it appears, 1. That they must not be aliens born or minors. 2. That they must not be any of the 12 judges, because they sit in the lords' house; nor of the clergy, for they sit in the convocation; nor persons attainted of treason, or felony, for they are unfit to sit any where. 3. That sheriffs of counties, and mayors and bailiffs of boroughs, are not eligible in their respective jurisdictions, as being returning officers; but that sheriffs of one county are eligible to be knights of another. 4. That, in strictness, all members ought to have been inhabitants of the places for which they are chosen; but this, having been long disregarded, was at length entirely repealed by statute 14 Geo. III. c. 58. 5. That no persons concerned in the management of any duties or taxes created since 1692, except the commissioners of the treasury, nor any of the officers following, (viz. commissioners of prizes, transports, sick and wounded, wine-licences, navy, and victualling; secretaries or receivers of prizes; comptrollers of the army-accounts; agents for regiments; governors of plantations, and their deputies; officers of Minorca or Gibraltar; officers of the excise and customs; clerks or deputies in the several offices of the treasury, exchequer, navy, victualling, admiralty, pay of the army or navy, secretaries of state, salt, stamps, appeals, wine-licences, hackney-coaches, hawkers, and pedlars), nor any persons that hold any new office under the crown created since 1705, are capable of being elected or sitting as members. 6. That no person having a pension under the crown during pleasure, or for any term of years, is capable of being elected or sitting. 7. That if any member accepts an office under the crown, except an officer in the army or navy accepting a new commission, his seat is void; but such member is capable of being re-elected. 8. That all knights of the shire shall be actual knights, or such notable esquires and gentlemen as have estates sufficient to be knights, and by no means of the degree of yeomen. This is reduced to a still greater certainty by ordaining, 9. That every knight of a shire shall have a clear estate of freehold or copyhold to the value of 600*l.* per annum, and every citizen and burgess to to the value of 300*l.*: except the eldest sons of peers and of persons qualified to be knights of shires, and except the members for the two universities: which somewhat balances the ascendant which the boroughs have gained over the counties by obliging the trading interest to make choice of landed men: and of this qualification the member must make oath, and give in the particulars in writing, at the time of his taking his seat. But, subject to these standing restrictions and disqualifications, every subject of the realm is eligible of common right: though there are instances, wherein persons in particular circumstances have forfeited that common right, and have been declared ineligible for that parliament, by a vote of the house of commons; or for ever, by an act of the legislature. But it was an unconstitutional prohibition, which was grounded on an ordinance of the house of lords, and inserted in the king's writs, for the parliament holden at Coventry, 6 Hen. IV. that no apprentice or other man of the law should be elected a knight for the shire therein: in return for which, our law-books and historians have branded this parliament with the name of *parliamentum indoctum*, or the lack-learning parliament; and sir Edward Coke observes with some spleen, that there was never a good law made thereat.

3. The third point, regarding elections, is the method of proceeding therein. This is also regulated by the law of parliament, and various statutes; all which we shall blend together, and extract out of them a summary ac-

count of the method of proceeding to elections.

As soon as the parliament is summoned, the lord chancellor (or if a vacancy happens during the sitting of parliament, the speaker, by order of the house, and without such order if a vacancy happens by death in the time of the recess for upwards of 20 days) sends his warrant to the clerk of the crown in chancery; who thereupon issues out writs to the sheriff of every county for the election of all the members to serve for that county, and every city and borough therein. Within three days after the receipt of this writ, the sheriff is to send his precept, under his seal, to the proper returning officers of the cities and boroughs, commanding them to elect their members; and the said returning officers are to proceed to election within eight days from the receipt of the precept, giving four days notice of the same; and to return the persons chosen, together with the precept, to the sheriff.

But elections of knights of the shire must be proceeded to by the sheriffs themselves in person, at the next county-court that shall happen after the delivery of the writ. The county-court is a court held every month or oftener by the sheriff, intended to try little causes not exceeding the value of 40*s*. in what part of the county he pleases to appoint for that purpose: but for the election of knights of the shire, it must be held at the most usual place. If the county-court falls upon the day of delivering the writ, or within six days after, the sheriff may adjourn the court and election to some other convenient time, not longer than 16 days, nor shorter than 10; but he cannot alter the place, without the consent of all the candidates: and, in all such cases, 10 days public notice must be given of the time and place of the election.

And, as it is essential to the very being of parliament that elections should be absolutely free, therefore all undue influences upon the electors are illegal, and strongly prohibited. For Mr. Locke ranks it among those breaches of trust in the executive magistrate, which, according to his notions, amount to a dissolution of the government, "if he employs the force, treasure, and offices of the society to corrupt the representatives, or openly to pre-engage the electors, and prescribe what manner of persons shall be chosen: For thus to regulate candidates and electors, and new-model the ways of election, what is it (says he) but to cut up the government by the roots, and poison the very fountain of public security?" As soon, therefore, as the time and place of election, either in counties or boroughs, are fixed, all soldiers quartered in the place are to remove, at least one day before the election, to the distance of two miles or more; and not to return till one day after the poll is ended. Riots likewise have been frequently determined to make an election void. By vote also of the house of commons, to whom alone belongs the power of determining contested elections, no lord of parliament, or lord lieutenant of a county, hath any right to interfere in the election of commoners; and, by statute, the lord warden of the cinque-ports shall not recommend any members there. If any officer of the excise, customs, stamps, or certain other branches of the revenue, presumes to intermeddle in elections, by persuading any voter or dissuading him, he forfeits 100*l*. and is disabled to hold any office. See an interesting little pamphlet by Edward Randall, esq. of Cambridge, entitled, Freedom of Election the Law of the Land.

Thus are the electors of one branch of the legislature secured from any undue influence from either of the other two, and from all external violence and compulsion. But the greatest danger is that in which themselves co-operate, by the infamous practice of bribery and corruption. To prevent which it is enacted, that no candidate shall, after the date (usually called the *teste*) of the writs, or after the vacancy, give any money or entertainment to his electors, or promise to give any, either to particular persons, or to the place in general, in order to his being elected; on pain of being incapable to serve for that place in parliament. And if any money, gift, office, employment, or reward be given, or promised to be given, to any voter, at any time, in order to influence him to give or withhold his vote, as well he that takes as he that offers such bribe forfeits 500*l*. and is for ever disabled from voting and holding any office in any corporation; unless, before conviction, he will discover some other offender of the same kind, and then he is indemnified for his own offence. The first instance that occurs of election bribery, was so early as 13 Eliz. when one Thomas Longe (being a simple man, and of small capacity to serve in parliament) acknowledged that he had given the returning officer and others of the borough for which he was chosen four pounds to be returned member, and was for that premium elected. But for this offence the borough was amerced, the member was removed, and the officer fined and imprisoned. But as this practice hath since taken much deeper and more universal root, it hath occasioned the making of these wholesome statutes; to complete the efficacy of which, there is nothing wanting but resolution and integrity to put them in strict execution.

Undue influence being thus guarded against, the election is to be proceeded to on the day appointed; the sheriff or other returning officer first taking an oath against bribery, and for the due execution of his office. The candidates likewise, if required, must swear to their qualification, and the electors in counties to theirs; and the electors both in counties and boroughs are also compellable to take the oath of abjuration, and that against bribery and corruption. And it might not be amiss, if the members elected were bound to take the latter oath as well as the former; which, in all probability, would be much more effectual than administering it only to the electors.

The election being closed, the returning officer in boroughs returns his precept to the sheriff, with the persons elected by the majority: and the sheriff returns the whole, together with the writ for the county and the knights elected thereupon, to the clerk of the crown in chancery; before the day of meeting, if it be a new parliament, or within 14 days after the election, if it be an occasional vacancy; and this under penalty of 500*l.* If the sheriff does not return such knights only as are duly elected, he forfeits, by the old statutes of Henry VI. 100*l.*; and the returning officer in boroughs, for a like false return, 40*l.*; and they are besides liable to an action, in which double damages shall be recovered, by the later statutes of king William: and any person bribing the returning officer shall also forfeit 300*l.* But the members returned by him are the sitting members, until the house of commons, upon petition, shall adjudge the return to be false and illegal. The form and manner of proceeding upon such petition are now regulated by statute 10 Geo. III. c. 16. (amended by 11 Geo. III. c. 42. and made perpetual by 14 Geo. III. c. 15.), which directs the method of choosing by lot a select committee of 15 members, who are sworn well and truly to try the same, and a true judgment to give, according to the evidence.

Election of Scots Peers. See Lords.

Election is also the state of a person who is left to his own free will, to take or do either one thing or another, which he pleases. See Liberty.

Election, in theology, signifies the choice which God of his good pleasure makes of angels or men, for the objects of mercy and grace.

ELECTIONS, or Choice, in mathematics, signify the several different ways of taking any number of things proposed, either separately, or as combined in pairs, in threes, in fours, &c.; not as to the order, but only as to the number and variety of them. Thus, of the things a, b, c, d, e, &c. the elections of
one thing are (a,) $1=2^1-1$,
two things are (a, b, ab) $3=2_2-1$,
three things are (a, b, c, ab, ac, bc, abc) $7=2^3-1$, &c.; and of any number, n, all the elections are 2^n-1; that is, 1 less than the power of 2 whose exponent is n, the number of single things to be chosen, either separately or in combination.

ELE'CTIVE. *a.* (from *elect.*) 1. Regulated or bestowed by choice (*Bacon*). 2. Exerting the power of choice (*Grew*).

Elective attraction, in chemistry. See Affinity.

ELE'CTIVELY. *ad.* By choice; with preference of one to another (*Grew*).

ELECTOR, a person who has a right to elect or choose another to an office, honour, &c. Elector is particularly, and by way of eminence, applied to those princes of Germany in whom lies the right of electing the emperor; being all sovereign princes, and the principal members of the empire. The electoral college, consisting of all the electors of the empire, is the most illustrious and august body in Europe. Bellarmine and Baronius attribute the institution of it to pope Gregory V. and the emperor Otho III. in the tenth century; of which opinion are the generality of historians, and particularly the canonists: however, the number of electors was unsettled, at least till the thirteenth century. In 1356 Charles IV. by the golden bull, fixed the number of electors at seven, three ecclesiastics, viz. the archbishops of Mentz, Treves, and Cologne; and four seculars, viz. the king of Bohemia, count palatine of the Rhine, duke of Saxony, and marquis of Brandenburg. In 1648, this order was changed, the duke of Bavaria being put in the place of the count palatine, who, having accepted the crown of Bohemia, was outlawed by the emperor; but being at length restored, an eighth electorate was erected for the duke of Bavaria. In 1692, a ninth electorate was created by the emperor Leopold, in favour of the duke of Hanover, of Brunswick Lunenburg.

There are now, or at least were a short time since, ten electors, viz. the king or elector of Bohemia; the elector of Bavaria, now a king also; the elector of Saxony; the elector of Brandenburg (king of Prussia); the elector of Hanover; the elector arch-chancellor of the empire, whose residence is at Ratisbon; the elector of Saltsburgh; the elector of Baden; the elector now king of Wurtemburgh; and the elector of Hesse. We cannot enter into the changes that have been produced and still are producing by the present war. The object of Bonaparte has been to annihilate the high office of emperor of the Romans, and to make himself acknowledged as protector of the Rhenish confederacy in its stead.

ELE'CTORAL. *a.* (from *elector.*) Having the dignity of an *elector.*

ELE'CTORATE. *s.* (from *elector.*) The territory of an elector (*Addison*).

ELE'CTRE. *s.* (*electrum*, Lat.) 1. Amber; which, having the quality when warmed by friction of attracting bodies, gave to one species of attraction the name of electricity, and to the bodies that so attract the epithet *electric.* 2. A mixed metal (*Bacon*).

ELE'CTRICAL. Ele'ctric. *a.* (from *electrum.* See Electre.) 1. Attractive without magnetism; attractive by a peculiar property, supposed once to belong chiefly to amber (*Newt.*). 2. Produced by an electric body (*Bro.*).

Electric, in physics, is a term applied to those substances, in which the electric fluid can be excited, and accumulated, without transmitting it; and which are therefore called *non-conductors.* They are also called *original electrics*, and *electrics per se.*

The word is derived from ηλεκτρον, amber, one of the most observable non-conductors. To this class also belong glass, and all vitrifications, even of metals; all precious stones, of which the most transparent are the best; all resins, and resinous compositions; also sulphur, baked wood, all bituminous substances, wax, silk, cotton, all dry animal substances, as feathers, wool, hair, &c.; also paper, white-sugar, and sugar-candy; likewise air, oils, chocolate, calces of metals and semimetals, the ashes of animal and vegetable substances, the rust of metals, all dry vegetable substances, and stones, of which the hardest are the best.

The following is a list of electrics, and also of conductors, disposed according to the order of their perfection, beginning in each column with the most perfect of their class: thus glass is a more perfect electric than amber, and gold is a better conductor than silver.

ELECTRICS.

- Glass of all kinds.
- All precious stones, the most transparent the best.
- Amber.
- Sulphur.
- All resinous substances.
- Wax of all kinds.
- Silk and cotton.
- Dry external animal substances, as feathers, wool, and hair.
- Paper.
- Loaf sugar.
- Air when dry.
- Oils and metallic oxides.
- Ashes of animal and vegetable substances.
- Most hard stones.

CONDUCTORS.

- All the metals in the following order:
- Gold; silver; platina; brass; iron; tin; quicksilver; lead.
- The semi-metals.
- Metallic ores.
- Charcoal.
- The fluids of the animal body.
- Water, especially salt water, and other fluids, except oil.
- Ice, snow.
- Most saline substances.
- Earthy substances.
- Smoke, steam, and even a vacuum.

Substances of this kind may be excited, so as to exhibit the electric appearances of attracting and repelling light bodies, emitting a spark of light, attended with a snapping noise, and yielding a current of air, the sensation of which resembles that of a spider's web drawn over the face, &c. and a smell like that of phosphorus; and thus exciting may be either by friction, or by heating and cooling or by melting, and pouring one melted substance into another.

The term is peculiarly applied to the electric, viz. the globe, or cylinder, &c. used in electrical machines, to collect the electrical matter by rubbing it.

ELECTRICAL APPARATUS, consists of glass tubes, about three feet long, and an inch and a half in diameter, one of which should be closed at one end, and furnished at the other end with a brass cap and stop cock, to rarefy or condense the inclosed air; sticks of sealing wax, or tubes of rough glass, or glass tubes covered with sealing-wax, or cylinders of baked wood for producing the negative electricity; with proper rubbers, as black oiled silk, with amalgam upon it for the former, and soft new flannel, or hare skins, or cat skins, tanned with the hair on, for the latter; coated jars, or plates of glass, either single, or combined in a battery, for accumulating electricity; metal rods, as dischargers; an electrical machine; electrometers, and insulated stools, supported by pillars of glass, covered with sealing-wax; or baked wood, varnished or boiled in linseed-oil. See BATTERY, CONDUCTORS, DISCHARGER, LEYDEN PHIAL, &c.

ELECTRICAL BATTERY, consists of a large number of coated jars, placed near each other in a convenient manner. These being charged, or electrified, and connected with each other, are then suddenly exploded or discharged, with a prodigious effect. See BATTERY.

We shall here hint at two or three circumstances, which should be attended to by those who make experiments with electrical batteries. The jars of a large battery are liable to be broken at the time of their discharge; and particularly if it be constructed of the thinner glass, which is capable of receiving a greater charge than the thicker. In order to avoid this inconvenience, Mr. Nairne never discharges a battery through a good conductor, unless the circuit be at least five feet long; but the length of the circuit, though it may preserve the battery, proportionably weakens the force of the shock. Care should also be taken not to touch the wires of a battery with the hand; nor even that of a single jar, after the discharge, before the discharging rod be repeatedly applied to its sides; as there generally remains a residuum of the charge, which is sometimes very considerable. This residuum is occasioned by the electricity, which, whilst the jar, or battery, is charging, spreads itself over the uncoated surface of the glass, near the coating; this will not be discharged at first, but gradually returns to the coating after their first discharge. An interesting account of improvements in electrical batteries, with a method of augmenting their power, &c. as given by Mr. Cuthbertson, may be seen in Nicholson's Journal, vol. ii. p. 525, 4to.

ELECTRICAL DOUBLER, an instrument invented by Mr. Bennett, for accumulating electricity by doubling. It consisted of three metallic plates, capable of being applied to each other with their flat surface, but prevented from contact in this situation by a thin coating of varnish. They have insulating handles at the side, and may be brought into actual contact edgewise. The application of this instrument is somewhat tedious; and it is subject to various imperfections. The process of accumulating electricity by doubling was invented by Lichtenberg and Klincock, and greatly improved by Bennett in his doubler. In 1787 Dr. Darwin constructed a machine for performing the process, not entirely by the hand, as heretofore, but in part mechanically. In 1788, Mr. W. Nicholson made an instrument by which the whole act is reduced to the simple turning of a winch. This invention Mr. Nicholson has described under the appropriate name of the

Revolving doubler: it consists of the following parts. Two fixed plates of brass A and C, (fig. 7. Pl. 59.) are separately insulated and disposed in the same plane, so that a revolving plate B may pass very near them, without touching. Each of these plates is two inches in diameter; and they have adjusting pieces behind, which serve to place them accurately in the required position. D is a brass ball, likewise of two inches diameter, fixed on the extremity of an axis that carries the plate B. Besides the more essential purpose this ball is intended to answer, it is so loaded within on one side, that it serves as a counterpoise to the revolving plate, and enables the axis to remain at rest in any position. The other parts may be distinctly seen in fig. 8. The shaded parts represent metal, and the white represent varnished glass. ON is a brass axis, passing through the piece M, which last sustains the plates A and C. At one extremity is the ball D already mentioned; and the other is prolonged by the addition of a glass stick, which sustains the handle L and the piece GH separately insulated. E, F, are pins rising out of the fixed plates A and C, at unequal distances from the axis. The cross piece GH, and the piece K, lie in one plane, and have their ends armed with small pieces of harpsichord-wire, that they may perfectly touch the pins E, F, in certain points of the revolution. There is likewise a pin I, in the piece M, which intercepts a small wire proceeding from the revolving plate B. The touching wires are so adjusted by bending, that when the revolving plate B is immediately opposite the fixed plate A, the cross-piece GH connects the two fixed plates, at the same time that the wire and pin at I, form a communication between the revolving plate and the ball. On the other hand, when the revolving plate is immediately opposite the fixed plate C, the ball becomes connected with this last plate, by the touching of the piece K against F; the two plates, A and B, having then no connection with any part of the apparatus. In every other position the three plates and the ball will be perfectly unconnected with each other.

The action of this instrument is thus explained, by Mr. Nicholson: When the plates A and B are opposite each other, two fixed plates A and C may be considered as one mass; and the revolving plate B, together with the ball D, will constitute another mass. All the experiments yet made concur to prove, that these two masses will not possess the same electric state; but that, with respect to each other, their electricities will be plus and minus. These states would be simple and without any compensation, if the masses were remote from each other; but as that is not the case, a part of the redundant electricity will take the form of a charge in the opposed plates A and B. From other experiments it has been found that the effect of the compensation on plates opposed to each other, at the distance of one-fortieth part of an inch, is such that they require, to produce a given intensity, at least 100 times the quantity of electricity that would have produced it in either, singly and apart. The redundant electricities in the masses under consideration will, therefore, be unequally distributed: the plate A will have about 99 parts, and the plate C only 1; and for the same reason, the revolving plate B will have 99 parts of the opposite electricity, and the ball D only 1. The rotation, by destroying the contacts, preserves this unequal distribution, and carries B from A to C, at the same time that the tail K connects the ball with the plate C. In this situation, the electricity in B acts upon that in C, and produces the contrary state, by virtue of the communication between C and the ball; which last must, therefore, acquire an electricity of the same kind with that of the revolving plate. But the rotation again destroys the contact, and restores B to its first situation opposite A. Here, if we attend to the effect of the whole revolution, we shall find that the electric states of the respective masses have been greatly increased: for the 99 parts in A and in B remain, and the one part of electricity in C has been increased so as nearly to compensate 99 parts of the opposite electricity in the revolving plate B, while the communication produced an equal mutation in the electricity of the ball. A second rotation will, of course, produce a proportional augmentation of these increased quantities; and a continuance of turning will soon bring the intensities to their maximum, which is limited by an explosion between the plates. If one of the parts be connected with an electrometer, more especially that of Bennett, these effects will be very clearly seen. The spark is usually produced by a number of turns between 11 and 20, and the electrometer is sensibly acted upon by still fewer. (Nicholson's Journal, vol. iv, p. 96. 4to.)

This beautiful mechanism of Mr. Nicholson's has the inconveniency of bringing the plates towards each other edgewise, which will bring on a spark or communication sooner than may be desired; but this is no inconvenience whatever in any philosophical research; because, before this happens, the electricity has become very distinguishable as to its kind, and the degree of multiplication is little more than an amusement. The spark may even serve to give an indication of the original intensity, by means of the number of turns necessary for producing it. If the fine wires which form the alternate connections in so ingenious a manner could be tipped with little balls to prevent the dissipation, it would be a great improvement indeed. An alternate motion, like that of a pump handle, might be adopted with advantage. This would allow the plates to approach each other face to face, and admit a greater multiplication, if thought necessary.

Electric fluid, a fine, rare fluid, which is supposed to issue from and surround electrical bodies. See Electricity.

Electrical kite was contrived by Dr. Franklin, to verify his hypothesis of the indentity of electricity and lightning. It consisted of a large, thin, silk handkerchief, extended and fastened at the four corners to two slight strips of cedar, and accommodated with a tail, loop, and string, so as to rise in the air like those of paper. To the top of the upright stick of the cross a very sharp pointed wire was fixed, rising a foot or more above the wood; and to the end of the twine, next the hand, a silk riband was tied From a key suspended at the union of the twine and silk, when the kite is raised during a thunder-storm, a phial may be charged, and electric fire collected, as is usually done by means of a rubbed glass tube, or globe. Phil. Trans. vol. xlvii. p. 565, or Franklin's Letters, p. 111, 112.

Kites made of paper, covered with varnish, or with well boiled linseed-oil, in order to preserve them from the rain, with a stick and cane bow, like those of schoolboys, will answer the purpose extremely well, and are very useful in determining the electricity of the atmosphere. See Conductor.

Electrical machine, is a part of the electrical apparatus, contrived for collecting a great quantity of electricity, and exhibiting its effects in a very sensible manner. It consists of the electric, the moving engine, the rubber, and the prime conductor. In the early state of this science, for the electric was used sealing-wax, sulphur, or rough glass; but, since the method of insulating the rubber, and so producing negative electricity, was introduced, smooth glass has been used. The form is commonly either that of a globe, or of a cylinder. Each figure has its advantages, and its inconveniences. Dr. Van Marum, a late German writer, has constructed a machine, in which gum-lac, in the form of a disc, is used as an electric instead of glass; which has the effect of depending very little on the temperature of the air; described in his Verhandeling over het Electrizeeren, &c. or a Treatise concerning the method of electrifying. Groningen, 1776. But he has since procured some others to be made by Mr. Cuthbertson, a very ingenious artist, of large discs, or round plates of glass: one of these is now placed in Teyler's Museum at Harlem, having two of these glass plates, of 65 inches diameter, excited on both sides of them, by rubbers of waxed taffaty; with which effects are produced that are truly astonishing and tremendous. See his description of this machine, and its effects, published in 4to, at Harlem, 1785, &c.

Mr. Nicholson has also given a description of this machine, with plates, in his Journal, vol. i. p. 83, where he likewise institutes a comparison between electrical machines with a cylinder, and those which produce their effect by means of a circular plate of glass: he concludes that Dr. Van Marum's machine is at least equal in steady intensity, and much superior in power of charging to any cylinder machine which has ever been made.

There have been various contrivances for giving motion to the electric of a machine. Some have used multiplying wheels, which are easily turned by a winch. The common method is to fix a wheel, grooved round its circumference on the outside of the frame of the machine, which may be turned by a winch; and on the neck of the globe, or cylinder, to fix a pulley, whose diameter is about a third or fourth part of the diameter of the wheel; and a string of worsted, or a leathern strap, is put over both the wheel and the pulley; so that by turning the winch the electric may make three or four revolutions for one revolution of the wheel. As the string relaxes by use, it may be proper to make the wheel moveable from the frame, so that it may be fixed by means of a screw at a proper distance, for a sufficient tension of the string; or the pulley may have several grooves, forming circumferences of different diameters for this purpose. Instead of the pulley and string, some have used a wheel and pinion, or a wheel and endless screw, which renders the machine more neat and compact; though this construction is not without its inconveniences, which are not so easily remedied as those of the other. But Dr. Van Marum's machine seems to have as complete a movement as any, its operation being very uniform, and easily worked; it is kept in motion by a weight, which, after being wound up to the height of 12 feet, will continue the motion uniformly for 6 hours; yielding also a negative power, as well as the positive; and the conductors annexed to it serving easily to convey the electrical power wherever it is required, without the addition of any chain, or wires, &c.

The next principal part of a machine is the rubber, which excites the electric. Rubbers were formerly made of red basil skins, stuffed with hair, wool, flax, or bran; but Dr. Nooth has lately introduced silk cushions stuffed with hair, over which a piece of leather is to be laid, rubbed with amalgam, which are preferable to the others. If the rubber is fixed on a metal plate, the plate should be free from all edges and points, and covered with silk; it should rest on a spring, so that it may be made to suit any inequalities in the surface of the glass, which spring may, by means of a screw, be made to press more or less against the glass at pleasure. The rubber should also be insulated in any way that may best suit the construction of the machine, and the disposition of the electric; and a chain or wire may be easily suspended from it, to communicate with the floor, whenever the insulation is not necessary; and thus positive and negative electricity may be produced at pleasure.

The prime conductor, which is a necessary appendage to the electrical machine, in order to collect the electricity from the electric, and the method of insulating it, have been already described. See PRIME CONDUCTOR.

To this general account of electrical machines, we shall subjoin a description of some of the principal now in use, illustrated by corresponding figures.

Fig. 1, Plate 59, is a plate-glass machine, of the most portable construction, with a double Leyden phial made square to suit the base, which answers all the purposes of medical electricity. ABC is a wooden frame to which the four rubbers are affixed, and by means of screws may be made to bear with proper pressure on the circular glass plate DF; this plate has a hole through its middle, to which an axis is firmly fixed, and it is turned by the winch L; GG is a Leyden phial (with the collectors *oo* fixed on the top) fixed in a larger one H: when a strong shock is wanted, the long pin I is let in to touch the bottom, by which means the large jar acts; but when drawn out, the small one acts alone, but much quicker, from being inclosed in the other. K is the electrometer. When this machine is constructed on a large scale for experiments, a prime conductor may be attached to the wooden frame opposite the axis of the plate-glass instead of the jar. Fig. 2, is a side view of the machine, with a clamp N to fix it to the table when used.

The advantages of this machine are, that it may be made portable, and is of so simple a construction, that any gentleman in the country, after procuring a plate of a reasonable thickness from a glass-house, may, by the aid of a common cabinet-maker, construct one for his own use; the conductor may be equally insulated by rosin, wax, silk, or any other electric or non-conducting substance.

The machine represented at figs. 3 and 4, Plate 59, was constructed by Dr. Priestley, and is well adapted to most purposes of the electrician. The frame consists of two boards of mahogany, *a*, *a*, parallel to one another, and about four inches asunder; the lower board may be fixed to a table by iron cranks; two upright pillars of baked wood are supported by this board, one of which, *b*, being let through the upper, is fixed immoveably to the lower board; but the other is made to slide in a groove, reaching almost the whole length of the upper board, so that it may be placed at any required distance from the other pillar, for the convenience of admitting globes, or cylinders, of different sizes; however, it is necessary only when an axis is used. In both pillars there are several holes, by means of which globes of different sizes may be mounted higher or lower, or two or more globes may be used at the same time; though it will be difficult to fix proper rubbers to them all. When a globe with one neck is used, a brass arm, with an open socket *c*, is necessary to support the axis beyond the pulley; and this part may be put higher or lower, together with the brass socket in which the axis turns. The axis *d*, is made to pass through the pillar *b*, so that it may be turned by a handle without the wheel. The frame being screwed to the table, may be placed nearer to, or farther from the wheel, as the length of the string in different states of the weather may require. The wheel is fixed in a frame by itself, as *e*, and thus it may have any situation with respect to the pulley, as may be most convenient; and it has several grooves for admitting more strings than one, if two or three globes, or cylinders, are used at once. The rubber *f*, consists of a hollow piece of copper filled with horse-hair, and covered with a basil skin; it is supported by a socket, which receives the cylindrical axis of a round plate of glass *g*, the opposite part of which is inserted into the socket of a bent steel spring *h*. These parts are easily separated, so that the rubber, or the plate of glass, serving to insulate it, may be changed at pleasure. The spring may be either slipped along the groove, or moved in the contrary direction, so as to give it every desirable position with respect to the globe or cylinder; and it is also furnished with a screw *i*, which makes it press harder or lighter, as the operator chooses: *klm* is the prime conductor, being a copper tube supported on a stand of glass, or baked wood.

Fig. 5, shews Mr. Nairne's patent machine for medical purposes. Its glass cylinder is about seven inches in diameter, and twelve long, with two conductors parallel to it. The rubber is fastened to the conductor R; and consists of a cushion of leather stuffed, having a piece of silk glewed to its under part. The conductors are of tin, covered with black lacker, each of them containing a large coated glass jar, and likewise a smaller one, or a coated tube, which are visible when the caps N, N, are removed. To each conductor is fixed a knob O, for the occasional suspension of a chain to produce positive, or negative electricity. That part of the winch C, which acts as a lever in turning the cylinder, is of glass. Thus every part of the machine is insulated, the cylinder itself, and its brass-cap, not excepted; by which means very little of the electricity is dissipated; and hence, of course, the effects are likely to be the more powerful. To this machine the inventor has adapted some flexible conducting joints, a discharging electrometer, &c. for the practice of medical electricity.

Fig. 1, Plate 60, represents a very portable electrical machine, invented by Mr. Read, and improved by Mr. Lane. A is the glass cylinder, moved vertically, by means of the pulley at the lower end of the axis, the pulley being turned by the large wheel B, parallel to the table; there are several pulleys, of different sizes, either of which may be used, according as the motion is required to be quicker or slower. The conductor C is furnished with points to collect the fluid, and is screwed to the wire of a coated jar D. The figure shews also the manner of applying Mr. Lane's electrometer to this machine. See ELECTROMETER.

Fig. 6, Plate 59, exhibits the electrical machine of the late ingenious and worthy Mr. George Adams: which we shall explain, and shew in what way it may be excited most powerfully. The parts of the machine which fall most immediately under our attention are, 1. The electric, or the glass cylinder, which is to be excited. 2. The mechanical contrivances by which it is put in motion. 3. The cushion and its appendages. 4. The conductor or conductors. The glass cylinder of the machine is put in motion by a simple winch. This is less liable to be put out of order than those that are turned with a multiplying wheel, and also enables us to excite the machine more powerfully. The cylinder FGHI, is supported by two strong perpendicular pieces DE. The axis of one cap of the cylinder moves in a small hole at the upper part of one of the supports. The opposite axis passes through the upper part of the other support. To this axis the winch or handle is fitted. The cushion is supported and insulated by a glass pillar; the lower part of which is fitted into a wooden socket, to which a regulating screw is adapted, to increase or diminish the pressure of the cushion against the cylinder. A piece of silk comes from the under edge of the cushion, and lies on the cylinder, passing between it and the cushion, and proceeding till it nearly meets the collecting points of the conductor. The more strongly this cylinder is made to adhere to the cylinder, the stronger is the degree of excitation. Before the cylinder, or opposite to the cushion, is a metallic tube YZ, supported by a glass pillar LM. This is sometimes called the prime conductor, often only the conductor. For the more conveniently trying experiments on the two powers, and exhibiting the different states of the cushion and conductor, there are two wires to be fixed occasionally, the one to the conductor, the other to the cushion; on the upper part of these are balls furnished with sliding wires, that they may be set apart from each other at different distances.

It will be necessary, before the electrical machine is put in motion, to examine those parts which are liable to wear either from the friction of one surface against another, or to be injured by the dirt, that may insinuate itself between the rubbing surfaces. If any grating or disagreeable noise is heard, the place from whence it proceeds must be discovered, wiped clean, and rubbed over with a small quantity of tallow; a little of which should also be occasionally applied to the axis of the cylinder itself. The screws by which the frame is fixed should also be examined, and if they are loose, they should be tightened.

Having examined the different parts of the machine, and put them in order, the glass cylinder, and the pillars which support the cushion and conductor, should be well wiped with a dry old silk handkerchief, to free them from the moisture which glass attracts from the air, being particularly attentive to leave no moisture on the ends of the cylinder, as any damp on these parts carries off the electric fluid, and lessens the force of the machine: in very damp weather it will be proper to dry the whole machine, by placing it at some little distance from the fire.

Care should be taken that no dust, loose threads, or filaments, adhere to the cylinder, its frame, the conductors, or their insulating pillars; because these will gradually dissipate the electric fluid, and prevent the machine from acting powerfully. When you are satisfied of this, rub the glass cylinder first with a clean, coarse, dry, warm cloth, or a piece of wash leather, and then with a piece of dry, warm, soft silk; do the same to all the glass insulating pillars of the machine and apparatus; these pillars must be rubbed more lightly than the cylinder, because, being varnished, they may be damaged by too much friction.

It may be proper in some cases to place a hot iron on the foot of the conductor, in order to evaporate the moisture which would otherwise injure the experiments.

Observe that, 1. To excite the machine, it is requisite to clean the cylinder, and wipe the silk. 2. Grease the cylinder, by turning it against a greasy leather, till it is uniformly obscured. The tallow of a candle will answer this purpose. 3. Turn the cylinder till the silk flap has wiped off so much of the grease as to render it semi-transparent. 4. Spread some amalgam on a piece of leather, and apply this against the turning cylinder. By this the friction will immediately increase, and the leather must not be removed until it ceases to become greater. 5. Remove the leather, and then the action of the machine will be very powerful. 6. The pressure of the cushion cannot be too small, when the excitation is well conducted.

The best kind of amalgam is that of Dr. Higgins, composed of zinc and quicksilver; if a little of the latter be added to melted zinc, it renders it easily pulverable, and more quicksilver must be added to the powder, if we want to make a very soft amalgam. It is apt to crystallize by keeping, which seems in some measure to be prevented by triturating it with a small proportion of grease: and it is always of advantage to triturate it before using.

In Nicholson's Journal, vol. i. p. 506, 4to. there is a description of a useful portable electrical machine, by the rev. W. Pearson: and in vol. iii. p. 4, of the same journal, is described a pocket ribband machine, which may often be advantageously used in medicine, when a larger electrical machine is not at hand.

Electrical shock, denotes the explosion between the opposite sides of a charged electric; so called, because, if the discharge from one to the other be made through the body of an animal, it occasions a sudden motion by the contraction of the muscles through which it passes, and a disagreeable sensation. The force of the shock is proportioned to the quantity of coated surface, the thinness of the glass, and the power of the machine by which it is charged. Its velocity is almost instantaneous, as it has not been found to take up the least sensible space of time in passing to the greatest distances.

It has been observed that the electrical shock is weakened by being communicated through different persons in contact with one another. It is, indeed, obstructed in its passage, even through the best conductors; as it will prefer a short passage through the air to a long one through the most perfect conductors; and if the circuit be interrupted, either by electrics, or very imperfect conductors of a moderate thickness, the shock will rend them in its passage, disperse them in every direction, and exhibit the appearance of a sudden expansion of the air about the centre of the shock. A strong shock made to pass through or over the belly of a muscle, forces it to contract; and sent through a small animal body deprives it instantly of life, and hastens putrefaction. It gives polarity to magnetic needles, reverses their poles, and produces effects precisely similar, though inferior in degree, to those of lightning.

ELECTRICITY, or Electrical force, is that power or property, which was first observed in amber, the lyneurium, or tourmalin, and which sealing-wax, glass, and a variety of other substances, called electrics, are now known to possess, of attracting light bodies, when excited by heat or friction; and which is also capable of being communicated in particular circumstances to other bodies.

Electricity also denotes the science, or that part of natural philosophy, which proposes to investigate the nature and effects of this power. From ἤλεκτρον, the Greek name for amber, is derived the term electricity, which is now very extensively applied, not only to the power of attracting light bodies inherent in amber, but to other similar powers, and their various effects, in whatever bodies they reside, or to whatever bodies they may be communicated.

Muschenbroek and Æpinus have observed a considerable analogy, in a variety of particulars, between the powers of electricity and magnetism; and they have also pointed out many instances in which they differ.

History of Electricity.—The property which amber possesses of attracting light bodies, was very anciently observed. Thales of Miletus, 600 years before Christ, concluded from hence that it was animated. But the first person who expressly mentioned this substance, was Theophrastus, about 300 years before Christ. The attractive property of amber is also occasionally noticed by Pliny, and other later naturalists, particularly Gassendus, Kenelm Digby, and sir Thomas Brown. But it was generally apprehended that this quality was peculiar to amber and jet, and perhaps agate, till W. Gilbert, a native of Colchester, and a physician in London, published his Treatise De Magnete, in the year 1600. Dr. Gilbert made many considerable experiments and discoveries, considering the then infant state of the science. He enlarged the list both of electrics, and of the bodies on which they act: he remarked, that a dry air was most favourable to electrical appearances, whilst a moist air almost annihilates the electric virtue: he also observed the conical figure assumed by electrified drops of water: he considered electrical attraction separately from repulsion, which he thought had no place in electricity, as a phenomenon similar to the attraction of cohesion, and he imagined, that electrics were brought into contact with the bodies on which they act by their effluvia, excited by friction.

The ingenious Mr. Boyle added to the catalogue of electric substances; but he thought that glass possessed this power in a very low degree: he found, that the electricity of all bodies, in which it might be excited, was increased by wiping and warming them before they were rubbed; that an excited electric was acted upon by other bodies as strongly as it acted upon them; that diamonds rubbed against any kind of stuff, emitted light in the dark; and that feathers would cling to the fingers, and to other substances, after they had been attracted by electrics. He accounted for electrical attraction, by supposing a glutinous effluvia emitted from electrics, which laid hold of small bodies, in its way, and carried them back to the body from which it proceeded.

Otto Guericke, the celebrated inventor of the air-pump, lived about the same time. This ingenious philosopher discovered, by means of a globe of sulphur, that a body once attracted by an electric, was next repelled, and continued in this state of repulsion till it should be touched by some other body: he also observed the sound and light produced by the excitation of his globe; and that bodies immerged in electrical atmospheres are themselves electrified with an electricity opposite to that of the atmosphere.

The light emitted by electrical bodies was, not long after, observed to much greater advantage by Dr. Wall, who ascribes to light the electrical property which they possess; and he suggests a similarity between the effects of electricity and lightning.

Sir Isaac Newton was not inattentive to this subject: he observed that excited glass attracts light bodies on the side opposite to that on which it is rubbed; and he ascribes the action of electric bodies to an elastic fluid, which freely penetrates glass, and the emission of it to the vibratory motions of the parts of excited bodies.

Mr. Hawksbee wrote on this subject in the year 1709, when a new æra commenced in the history of this science. He first took notice of the great electrical power of glass, and the light proceeding from it; though others had before observed the light proceeding from other electrified substances: he also noted the noise occasioned by it, with a variety of phenomena relating to electrical attraction and repulsion. He first introduced a glass globe into the electrical apparatus, to which circumstance it was that many of his important discoveries were owing.

After his time there was an interval of near twenty years in the progress of this science, till Mr. Stephen Grey established a new æra in the history of electricity. To him we owe the capital discovery of communicating the power of native electrics to other bodies, in which it cannot be excited, by supporting them on silken lines, hair lines, cakes of resin or glass; and a more accurate distinction than had hitherto obtained between electrics and non-electrics: he also shewed the effect of electricity on water much more obviously than Gilbert had done in the infancy of this science.

The experiments of Mr. Grey were repeated by M. du Fay, member of the Academy of Sciences at Paris, to which he added many new experiments and discoveries of his own. He observed, that electrical operations are obstructed by great heat, as well as by a moist air; that all bodies, both solid and fluid, would receive electricity, when placed on warm or dry glass, or sealing-wax; that those bodies which are naturally the least electric, have the greatest degree of electricity communicated to them by the approach of the excited tube. He transmitted the electric virtue through a distance of 1256 feet; and first observed the electric spark from a living body, suspended on silken lines, and noted several circumstances attending it. M. du Fay also established a principle, first suggested by Otto Guericke, that electric bodies attract all those that are not so, and repel them as soon as they are become electric, by the vicinity or contact of the electric body. He likewise inferred from other experiments, that there were two kinds of electricity; one of which he called the *vitreous*, belonging to glass, rock crystal, &c. and the other *resinous*, as that of amber, gum lac, &c. distinguished by their repelling those of the same kind, and attracting each other. He observed, that communicated electricity had the same property as the excited; and that electric substances attract the dew more than conductors.

Mr. Grey, resuming his experiments in 1734, suspended several pieces of metal on silken lines, and found, that by electrifying them, they gave sparks, which was the origin of metallic conductors; and, on this occasion, he discovered a cone or pencil of electric light, such as is now known to issue from an electrified point. From other experiments he concludes, that the electrical power seems to be of the same nature with that of thunder and lightning.

Dr. Desaguliers succeeded Mr. Grey in the prosecution of this science. The account of his first experiments is dated in 1739. To him we owe those technical terms of *conductors*, or *non-electrics*, and *electrics per se*, which are explained in the course of this work. He first ranked pure air among the *electrics per se*, and supposed its electricity to be of the vitreous kind. After the year 1742, in which Dr. Desaguliers concluded his experiments, the subject was taken up and pursued in Germany: the globe was now substituted for the tube, which had been used ever since the time of Hauksbee, and a cushion was soon after used as a rubber instead of the hand. About this time, some used cylinders instead of globes; and some of the German electricians made use of more globes than one at the same time. By thus increasing the electrical power, they were the first who succeeded in setting fire to inflammable substances. This, indeed, was first done by Dr. Ludolf, in the beginning of the year 1744, who kindled, with sparks excited by the friction of a glass tube, the ætherial spirit of Frobenius. Mr. Winkler did the same by a spark from his own finger, and kindled French brandy and other spirits by previously heating them. Mr. Gralath fired the smoke of a candle just blown out, and lighted it again; and Mr. Boze fired gunpowder, by means of its inflammable vapour. Ludolf the younger, about this time, demonstrated, that the luminous barometer was made perfectly electrical by the motion of the quicksilver: the electrical star and electrical bells were also of German invention.

The most remarkable discovery that had yet been made in the science of electricity, was in the end of the year 1745, and beginning of 1746. This was the method of giving the electric shock, or the accumulation of the power of electricity in a vial. This had its name of the Leyden vial, from Mr. Cunæus, a native of Leyden, who exhibited it as he was repeating some experiments made by Messrs. Muschenbroek and Allamand, professors in the university of that city. It is said, he was not, however, the inventor. The merit of this discovery (if any merit can be ascribed to a discovery made by accident) belongs to Mr. Van Kleist, dean of the cathedral at Camin. Soon after this, however, a method of giving the shock was discovered in Holland, by Mr. Cunæus; and the discovery of this powerful effect of the electric fluid immediately raised the attention of all the philosophers in Europe. Many of them greatly exaggerated their accounts; either from a natural timidity, or their love of the marvellous. Mr. Muschenbroek, who tried the experiment with a very thin glass bowl, told Mr. Reaumur, in a letter written soon after the experiment, that he felt himself struck in his arms, shoulder, and breast, so that he lost his breath; and was two days before he recovered from the effects of the blow and the terror. He added, that he would not take a second shock for the whole kingdom of France. Mr. Allamand, who made the experiment with a common beer-glass, said, that he lost his breath for some moments; and then felt such an intense pain all along his right arm, that he was apprehensive of bad consequences, but it soon after went off without any inconvenience, &c. Other philosophers, on the contrary, showed their heroism and magnanimity, by receiving a number of electric shocks as strong as they could possibly make them.

From the time of this discovery, electricity became the general subject of conversation. A number of people all over Europe got their livelihood by going about and showing the phenomena of it; and, at the same time, the passion for the marvellous strongly discovered itself in some effects of electricity, pretended to be found out in Italy and Germany. Mr. Nollet travelled into Italy, where he visited all the gentlemen who had published any account of these experiments. But though he engaged them to repeat their experiments in his presence, and upon himself; and though he made it his business to get all the information he could concerning them; he returned fully convinced, that many things alleged of the electrical fluid were totally groundless. He was convinced, however, that by electrification alone, several persons had found considerable relief in various disorders; particularly, that a paralytic person had been cured at Geneva, and that one who was deaf of an ear, another who had a violent pain in his head, and a woman with a disorder in her eyes, had been cured at Bologna; so that from this time we may date the introduction of electricity into the medical art.

But the identity of the electrical matter with lightning, was a discovery of more practical use to mankind than any other. From almost the first discovery of the electric light, and the crackling with which it is emitted, a similarity between it and the phenomena of thunder and lightning had been observed. This is taken notice of by Dr. Wall, one of the first who viewed the electric light in any perfect manner. The Abbé Nollet, Mr. Winkler, and others, also enumerated many resemblances between the phenomena of electricity and those of thunder; but they did not think of any method by which their suspicions could be brought to the test of experience. This was first proposed by Dr. Franklin, in 1750. He had before discovered the effects of pointed bodies in drawing off the electric matter more powerfully than others. This was suggested to him by one Mr. Thomas Hopkinson, who electrified an iron ball of three or four inches diameter with a needle fastened to it, expecting to draw a stronger spark from the point of it, but was surprised to find little or none. Dr. Franklin, improving on this hint, discovered that pointed rods of iron, fixed in the air when the atmosphere was loaded with lightning, drew from it the matter of the thunder-bolt, without noise or danger, into the body of the earth. Thus a new field was opened for philosophers; but it was soon found, that experiments of this kind were not always to be made without danger. In the same year, 1752, the Abbé Nollet published some cautions to those who tried experiments on lightning. He had been informed by letters from Florence and Bologna, that some people there had received violent shocks while they drew sparks from an iron bar electrified by thunder. One of his correspondents informed him, that once, as he was endeavouring to fasten a small chain with a copper ball at one of its extremities to a great chain which communicated with the bar at the top of the building, there came a flash of lightning which he did not see, but which affected the chain with a noise like that of wild-fire. The observer instantly received such a shock, that the ball fell out of his hands, and he was struck backwards four or five paces. The greatest instance of the danger of these experiments, however, was the death of Mr. Richman, professor at Petersburgh; which happened on the 6th of August, 1753, as he was making experiments on lightning drawn into his own room. Since the discovery of the identity of lightning and the electric matter, long rods of iron or other metal have been made use of with a view to protect buildings from the danger of strokes of lightning. A considerable dispute has been carried on whether these rods ought to be pointed or not; but a committee of the Royal Society have determined it in favour of the former. See CONDUCTOR.

In the subsequent period of the history of this science, Mr. Canton in England, and Signior Beccaria in Italy, acquired distinguished reputation. They both discovered, independently of each other, that air is capable of receiving electricity by communication, and of retaining it when received. Mr. Canton also, towards the latter end of 1753, pursued a series of experiments, which prove that the appearances of positive and negative electricity, which had hitherto been deemed essential and unchangeable properties of different substances, as of glass and sealing wax, for instance, depend upon the surface of the electrics, and that of the rubber.

This hypothesis, verified by numerous experiments, occasioned a controversy between Mr. Canton and Mr. Delaval, who still maintained that these different powers depended entirely on the substances themselves. About this time too, some curious experiments were performed by four of the principal electricians of that period, viz. Dr. Franklin, and Messrs. Canton, Wilcke, and Æpinus, to ascertain the nature of electric atmosphere.

Many instances occur in the history of the science about this period, of the astonishing force of the electric shock, in melting wires, and producing other similar effects; but the most remarkable is an experiment of S. Beccaria, in which he thus revivified metals. Several experiments were also made by Dr. Watson, Mr. Smeaton, Mr. Canton, and others, on the passage of the electric fluid through a vacuum, and its luminous appearance, and on the power possessed by certain substances of retaining the light communicated to them by an electric explosion. Mr. Canton, S. Beccaria, and others, made many experiments to identify electricity and lightning, to ascertain the state of the atmosphere at different times, and to explain the various phenomena of the aurora borealis, water-spouts, hurricanes, &c. on the principles of this science.

Those who are desirous of farther information with respect to the history of electrical experiments and discoveries, may consult Dr. Priestley's History and Present State of Electricity. This author, however, is not merely an historian: his work contains many original experiments and discoveries made by himself. He ascertained the conducting power of charcoal, and of hot glass; the electricity of fixed and inflammable air, and of oil; the difference between new and old glass, with respect to the diffusion of electricity over its surface; the lateral explosion in electrical discharges; a new method of fixing circular-coloured spots on the surfaces of metals, and the most probable difference between electrics and conductors, &c. The science is also greatly indebted to many other persons, either for their experiments and improvements of it, or for treatises and other writings upon it; as Mr. Henley, to whom we owe several curious experiments and observations on the electrical and conducting quality of different substances, as chocolate, vapour, &c. with the reason of the difference between them; the fusion of platina; the nature of the electric fluid, and its course in a discharge; the method of estimating the quantity of it in electrical bodies by an electrometer; the influence of points, &c. &c.

There have been, likewise, various treatises written on the subject of electricity, as by Adams, Cavallo, hon. Mr. Cavendish, Ferguson, lord Mahon, Morgan, Nairne, Van Marum, Van Swinden, &c. most of which may be consulted with advantage, for accounts of experiments, and the principles of the science. In the works of Mr. Cavendish, and lord Mahon, the authors have availed themselves of the susceptibility of electrical phenomena of mathematical discussion; and have thereby rendered essential service to the science. See also Haüy's Natural Philosophy, vol. i. p. 341—435.

According to the opinion of some philosophers, a new æra in the history of electricity commenced nearly twenty years ago; when the celebrated Galvani, professor of anatomy at Bologna, discovered an influence, which by him, and some other authors, has been called animal electricity. But we think it by no means proved, that the phenomena discovered by Galvani depend either upon the electric fluid, or upon any law of animal life: while that is the case, it is surely better to distinguish a new branch of science by the name of the inventor, than to give it an appellation, which may probably lead to an erroneous theory. We, therefore, reject the name animal electricity, and, for our account of this interesting subject, refer to the article GALVANISM.

Medical Electricity.—It is natural to imagine that a power of such efficacy as that of electricity would be applied to medical purposes; especially, since it has been found invariably to increase the sensible perspiration, to quicken the circulation of the blood, and to promote the glandular secretion: accordingly, many instances occur in the latter period of the history of this science, in which it has been applied with considerable advantage and success. And among the variety of cases in which it has been tried, there are none in which it has been found prejudicial except those of pregnancy and the venereal disease. In most disorders, in which it has been used with perseverance, it has given at least a temporary and partial relief, and in many it has effected a total cure. Of which numerous instances may be seen in the Philos. Trans. and the writings on this science by Messrs. Lovet, Westley, Ferguson, Cavallo, &c. &c.

Under this head of medical electricity, it may be proper just to mention those medicated tubes, the imaginary virtues of which were first discovered by Signior Pivati, at Venice, and which were much recommended in the years 1747 and 1748, both in Italy and by Mr. Winkler, at Leipsick. These gentlemen imagined, that odorous substances, confined in excited glass vessels, would transpire through the pores of the glass, and communicate their medicinal virtue to the atmosphere of a conductor, and to all persons in contact with it; and that these substances would yield their virtues by being held in the hands of persons electrified; and they pretended that many cures were wrought in this way, by the operation of medicines, without being taken into the stomach: but the whole was soon discovered to be a fallacy; and it was incontestibly proved, that no effluvia could pass from the included substances through the pores of excited glass; and that no method was known for causing the power of medicine to insinuate itself into the human body by electricity. Dr. Franklin, by proving that glass was impermeable to the electric fluid itself, and that its electricity was collected from the rubber, &c. evinced the absurdity of every attempt to transmit the effluvia of any substances through the glass. See Franklin's Letters, p. 82, &c.

Theory of Electricity.—It is hardly necessary to recite the ancient hypotheses on this subject; such as that of the sympathetic powder of the Peripatetics; that of unctuous effluvia emitted by excited bodies, and returning to them again, adopted by Gilbert, Gassendus, sir Kenelm Digby, &c.; or that of the Cartesians, who ascribed electricity to the globules of the first elements, discharged through the pores of the rubbed substance, and in their return carrying with them those light bodies, in whose pores they were entangled: these hypotheses were framed in the infancy of the science, and of philosophy in general, and have long since been exploded. In the more advanced state of electricity, there have been two principal theories, each of which has had its advocates. The one, is that of two distinct electric fluids, repulsive with respect to themselves, and attractive of one another, adopted by M. du Fay, on discovering the two opposite species of electricity, viz. the vitreous and resinous, and since new-modelled by Mr. Symmer. It is supposed that these two fluids are equally attracted by all bodies, and exist in intimate union in their pores; and that in this state they exhibit no mark of their existence. But that the friction of an electric by a rubber separates these fluids, and causes the vitreous electricity of the rubber to pass to the electric, and then to the prime conductor of a machine, while the resinous electricity of the conductor and electric is conveyed to the rubber: and thus the quality of the electric fluid, possessed by the conductor and the rubber, is changed, while the quantity remains the same in each. In this state of separation, the two electric fluids will exert their respective powers; and any number of bodies charged with either of them will repel each other, attract those bodies that have less of each particular fluid than themselves, and be still more attracted by bodies that are wholly destitute of it, or that are loaded with the contrary. According to this theory, the electric spark makes a double current; one fluid passing to an electrified conductor from any substance presented to it, whilst the same quantity of the other fluid passes from it: and when each body receives its natural quantity of both fluids, the balance of the two powers is restored, and both bodies are unelectrified. For a further account of the explication of some of the principal phenomena of electricity by this theory, see Dr. Priestley's History, vol. ii. § 3.

The other theory is commonly distinguished under the denomination of *positive and negative electricity*, being first suggested by D. Watson, but digested, illustrated, and confirmed by Dr. Franklin: and since that it has been known by the appellation of the Franklinian hypothesis. It is here supposed, that all the phænomena of electricity depend on one fluid, *sui generis*, extremely subtile and elastic, dispersed through the pores of all bodies, by which the particles of it are as strongly attracted as they are repelled by one another. When bodies possess their natural share of this fluid, or such a quantity as they can retain by their non-attraction, it is then said they are in an unelectrified state; but when the equilibrium is disturbed, and they either acquire an additional quantity from other bodies, or lose part of their own natural share by communication to other bodies, they exhibit electrical appearances. In the former case it is said they are electrified positively, or plus; and in the other negatively, or minus. This electric fluid, it is supposed, moves with great ease in those bodies that are called conductors, but with extreme difficulty and slowness in the pores of electrics; whence it comes to pass, that all electrics are impermeable to it. It is farther supposed that electrics contain always an equal quantity of this fluid, so that there can be no surcharge or increase on one side without a proportionable decrease or loss on the other, and vice versa; and as the electric does not admit the passage of the fluid through its pores, there will be an accumulation on one side, and a corresponding deficiency on the other. Then when both sides are connected together by proper conductors, the equilibrium will be restored by the rushing of the redundant fluid from the overcharged surface to the exhausted one. Thus also, if an electric be rubbed by a conducting substance, the electricity is only conveyed from one to the other, the one giving what the other receives; and if one be electrified positively, the other will be electrified negatively, unless the loss be supplied by other bodies connected with it, as in the case of the electric and insulated rubber of a machine. This theory serves likewise to illustrate the other phænomena and operations in the science of electricity. Thus, bodies differently electrified will naturally attract each other, till they mutually give and receive an equal quantity of the electric fluid, and the equilibrium is restored between them. Beccaria supposes, that this effect is produced by the electric matter making a vacuum in its passage, and the contiguous air afterwards collapsing, and so pushing the bodies together.

The influence of points, in drawing or throwing off the electric fluid, depends on the less resistance it finds to enter or pass off through fewer particles than through a greater number, whose resistance is united in flat or round surfaces. The electric light is supposed to be part of the electric fluid, which appears when it is properly agitated; and the sound of an explosion is produced by vibrations, occasioned by the air's being displaced by the electric fluid, and again suddenly collapsing.

Mr. Æpinus of the Imperial academy of St. Petersburgh, struck with the resemblance of the electrical properties of the tourmalin to the properties of a magnet, which have always been considered as the subject of mathematical discussion, remarked a wonderful similarity in the whole series of electrical and magnetical attractions and repulsions, and set himself seriously to the classification of them. Having done this with great success, and having maturely reflected on Dr. Franklin's happy thought of plus and minus electricity, and his consequent theory of the Leyden phial, he at last hit on a mode of conceiving the whole subject of magnetism and electricity, that bids fair for leading us to a full explanation of all the phænomena; in as far, at least, as it enables us to class them with precision, and to predict what will be the result of any proposed treatment. He candidly gives it the modest name of a hypothesis.

This was published at St. Petersburgh in 1759, under the title of Theoria Electritatis et Magnetismi, and is not only an ingenious, but a brilliant performance: it is a most excellent exposition of the Franklinean theory. According to Æpinus, the phænomena of electricity are produced by a fluid of a peculiar nature, and therefore called the *Electric fluid*, having the following properties:

1. *Its particles repel each other, with a force decreasing as the distances increase.*

2. *Its particles attract the particles of some ingredient in all other bodies, with a force decreasing, according to the same law, with an increase of distance; and this attraction is mutual.*

3. The electric fluid is dispersed in the pores of other bodies, and moves with various degeees of facility through the pores of different kinds of matter. In those bodies which we call non-electrics, such as water or metals, it moves without any perceivable obstruction; but in glass, rosins, and all bodies called electrics, it moves with very great difficulty, or is altogether immoveable.

4. The phænomena of electricity are of two kinds; 1. Such as arise from the actual motion of the fluid from a body containing more into one containing less of it. 2. Such as do not immediately arise from this transference, but are instances of its attraction and repulsion.

These things being supposed, certain consequences necessarily result from them, which ought to be analogous to the observed phænomena of electricity, if this hypothesis be complete, or some farther modification of the assumed properties is necessary, in order to make the analogy perfect.

Suppose the body A (a figure may readily be conceived) to contain a certain quantity of fluid. Its particles adjoining to the surface, such as P, are attracted by the particles of common matter in the body, but repelled by the other particles of the fluid. The totality of the attractive forces acting on P may be equal to the totality of the repulsive forces, or may be unequal. If these two sums are equal, P is in equilibrio, and has no tendency to change its place. But there may be such a quantity of fluid in the body, that the repulsions of the fluid exceed the attractions of the common matter. In this case, P has a tendency to quit the body, or there is an expulsive force acting on it, and it will quit the body if it be moveable. Because the same must be admitted in respect of every other particle of moveable fluid, it is plain that there will be an efflux, till the attraction of the common matter for the particles of fluid is equal to the repulsion of the remaining fluid. On the other hand, if the primitive repulsion of the fluid acting on the particle P be less than the attractions of the common matter, there will be the same, or at least a similar, superiority of attraction acting on the fluid residing in the circumambient bodies; and there will be an influx from all hands, till an equilibrium be restored.

Hence it follows, that there may always be assigned to any body such a quantity of fluid that there shall be no tendency either to efflux or influx. But if the quantity be increased, and nothing prevent the motion, the redundant fluid will flow out; and if the proper quantity be diminished, there will be an influx of the surrounding fluid, if not prevented by some external force. This may be called the body's natural quantity; because the body, when left to itself, will always be reduced to this state.

If two bodies, A and B, contain each its natural quantity, they will not exert any sensible action on each other: for, because the fluid contained in B is united by attraction to the common matter, and is also repelled by the fluid in A, it necessarily follows, that the whole body B is repelled by the fluid in A. But, on the other hand, the mater in A attracts the fluid in B, and consequently ttracts the whole body B: similar action is ex- rted by B on A. These contrary forces are ither equal, and destroy each other, or unequal, nd one of them prevails. This equality or in- quality evidently depends on the quantity of fluid ontained in one or both of the bodies. Now it known that bodies left entirely to themselves either attract nor repel; and it follows from the ypothetical properties of the fluid, that if there e either a redundancy or deficiency of fluid, there ill be an efflux or influx, till the attractions and epulsions balance each other. Therefore, the ternal state of two bodies which neither attract or repel each other, is that where each contains s natural quantity of electric fluid.

In order, therefore, to conceive distinctly the ate of a body containing its natural quantity, nd to have a distinct notion of this natural quan- ty, we must suppose that the quantity of fluid ompetent to a particle of matter in A repels the uid competent to a particle of matter in B, just s much as it attracts that particle of matter; and so, that the fluid belonging to a particle of mat- r in A repels the fluid belonging to a particle of atter in B, just as much as the particle of mat- r in A attracts it. Thus the whole fluid in the ne repels the whole fluid in the other as much s it attracts the whole matter.

Since this must be conceived of every particle f common matter in a body, we must admit, that hen a body is in its natural state, the quantity of lectric fluid in it is proportional to the quantity f matter, every particle being united with an qual quantity of fluid. This, however, does not ecessarily require that different kinds of matter, n their natural or saturated state, shall contain he same proportion of fluid. It is sufficient that ach contains such a quantity, uniformly distri- uted among its particles, that its repulsion for the luid in another body is equal to its attraction for he common matter in it. It is, however, more robable, that the quantity of electric fluid attach- d, or competent to a particle of all kinds of mat- er, is the same.

Since our hypothesis is accommodated to the act, that bodies in their natural state, having heir natural quantity of electric fluid, are altoge- her inactive on each other, by making this na- ural quantity such, that its mutual repulsion xactly balances its attraction for the common natter—it follows, that we must deduce all the lectric phænomena from a redundancy or defi- iency of electric fluid. This accordingly is the Franklinian doctrine. The redundant state of a ody is called by Dr. Franklin positive or plus elec- ricity, and the deficient state is called negative r minus electricity.

This simple hypothesis is found to coincide perfectly, in its legitimate consequences, with all the general phænomena of attraction and repulsion; not only with those that are simple, but even such as are compounded of many others: we may, therefore, listen to the other evidences which may be offered for the materiality and mobility of the cause of those mechanical phænomena. The transference of electricity is desultory, and the change made in the electric state of the communicating bodies is always considerable. It appears to keep some settled ratio to the whole electric power of the body. When the form of the parts where the communication takes place, and other circumstances, remain the same, the transference increases with the size of the bodies; and all the phænomena are more vivid in proportion. When the conductor is very large, the spark is very bright, and the snap very loud.

1. This snap alone indicates some material agent. It is occasioned by a sonorous undulation of the air, or of some elastic fluid, which suddenly expands, and as suddenly collapses again. But such is the rapidity of the undulation, that when it is made in close vessels it does not exist long enough, in a very expanded state, to affect the column of water, supported in a tube by the elasticity of the air, for the purpose of a delicate thermometer or barometer; just as a musket ball will pass through a loose hanging sheet of paper without causing any sensible agitation.

2. The spark is accompanied by intense heat, which will kindle inflammable bodies, will melt, explode, and calcine metals.

3. The spark produces some very remarkable chemical effects. It calcines metals even under water or oil; it renders Bolognan phosphorus luminous: it decomposes water, and makes new compositions and decompositions of many gaziform fluids; it affects vegetable colours; it blackens the calces of bismuth, lead, tin, luna cornea; it communicates a very peculiar smell to the air of a room, which is distinct from all others; and in the calcination of metals, it changes remarkably the smells with which this operation is usually accompanied; it affects the tongue with an acidulous taste; it agitates the nervous system. When we compare these appearances with similar chemical and physiological phænomena, which naturalists never hesitate in ascribing to the action of material substances, transferable from one body, or one state of combination, to another, we can see no greater reason for hesitating in ascribing the electric phænomena to the action of a material substance; which we may call a fluid, on account of its connected mobility, and the electric fluid, on account of its distinguishing effects. We are well aware, however, that these evidences do not amount to demonstration; and that it is possible that the electric phænomena, as well as many chemical changes, may result from the mere difference of arrangement, or position, of the ultimate particles of bodies, and may be considered as the result of a change of modes, and not of things.

One of the most remarkable facts in electricity is the rapid dissipation by sharp points, and the impossibility of making any considerable accumulation in a body which has any such, projecting beyond other parts of its surface. The dissipation is attended with many remarkable circumstances, which have greatly the appearance of the actual escape of some material substance. A stream of wind blows from such a point, and quickly electrifies the air of a room to such a degree, that an electrometer in the farthest corner of the room is affected by it. This dissipation in a dark place is, in many instances, accompanied by a bright train of light diverging from the point like a firework. Dr. Franklin therefore was very anxious to reconcile this appearance with his theory of plus and minus electricity, but does not express himself well satisfied with any explanation which had occurred to him. From the beginning, he saw that he could not consider the stream of wind as a proof of the escape of the electric fluid, because the same stream is observed to issue from a sharp negative point; which, according to his theory, is not dispersing, but absorbing it. Mr. Cavendish has, in our opinion, given the first satisfactory account of this phænomenon.

To see this in its full force, the phænomenon itself must be carefully observed. The stream of wind is plainly produced by the escape of something from the point itself, which hurries the air along with it; and this draws along with it a great deal of the surrounding air, especially from behind, in the same manner as the very slender thread of air from a blow-pipe hurries along with it the surrounding air and flame from a considerable surface on all sides. It is in this manner that it gathers the whole of a large flame into one mass, and, at last, into a very point. If the smoke of a little rosin thrown on a bit of live coal be made to rise quietly round a point projecting from an electrified body, continually supplied from an electrical machine, the vortices of this smoke may be observed to curl in from all sides, along the wire, forming a current of which the wire is the axis, and it goes off completely by the point. But if the wire be made to pass through a cork fixed in the bottom of a wide glass tube, and if its point project not beyond the mouth of the tube, the afflux of the air from behind is prevented, and we have no stream; but if the cork be removed, and the wire still occupy the axis of the tube, but without touching the sides, we have the stream very distinctly; and smoke which rises round the far end of the tube is drawn into it, and goes off at the point of the wire. Now it is of importance to observe, that whatever prevents the formation of this stream of wind prevents the dissipation of electricity (for we shall not say escape of electric fluid) from the point. If the point project a quarter of an inch beyond the tube, or if the tube be open behind, the stream is strong, and the dissipation so rapid, that even a very good machine is not able to raise a Henley's electrometer, standing on the conductor, a very few degrees. If the tube be slipped forward, so that the point is just even with its mouth, the dissipation of electricity is next to nothing, and does not exceed what might be produced by such air as can be collected by a superficial point. If the tube be made to advance half an inch beyond the point which it surrounds, the dissipation becomes insensible. All these facts put it beyond a doubt that the air is the cause, or, at least, the occasion of the dissipation, and carries the electricity off with it, in this manner rendering electrical the whole air of a room. The problem is reduced to explain how the air contiguous to a sharp electrified point is electrified and thrown off.

It has been demonstrated, that two spheres, connected by an infinitely extended, but slender conducting canal, are in electrical equilibrium, if their surfaces contain fluid in the proportion of their diameters. In this case, the superficial density of the fluid and its tendency to escape are inversely as the diameters. Now if, in imagination, we gradually diminish the diameter of one of the spheres, the tendency to escape will increase in a greater proportion than any that we can name. We know, that when the prime conductor of a powerful table machine has a wire of a few inches in length projecting from its end, and terminating in a ball of half an inch in diameter, we cannot electrify it beyond a certain degree; for when arrived at this degree, the electricity flies off in successive bursts from this ball. Being much more overcharged than any other part of the body, the air surrounding the ball becomes more overcharged by communication, and is repelled, and its place supplied by other air, not so much overcharged, which surrounded the other parts of the body, and is pressed forwards into this space by the general repulsion of the conductor and the confining pressure of the atmosphere; otherwise, being also overcharged, it would have no tendency to come to this place. Half a turn of the cylinder is sufficient to accumulate to a degree sufficient for producing one of these explosions, and we have two of them for every turn of the cylinder. A point may be compared to an incomparably smaller ball. The constipation of the fluid, and its tendency to escape, must be greater in the same unmeasurable proportion. This density and mutual repulsion cannot be diminished, and must even be increased by the matter of the wire forming a cone, of which the point is the apex; therefore, if there were no other cause, we must see that it is almost impossible to confine a collection of particles, mutually repelling, and constipated, as these are in a fine point.

But the chief cause seems to be a certain chemical union which takes place between the electric fluid and a corresponding ingredient of the air. In this state of constipation, almost completely surrounded by the air, the little mass of fluid must attract and be attracted with very great force, and more readily overcome the force which keeps the electrified fluid attached to the last series of particles of the wire. It unites with the air, rendering it electric in the highest degree of redundancy. It is therefore strongly repelled by the mass of constipated fluid which succeeds it within the point. Thus is the electrified air continually thrown off, in a state of electrification, that must rapidly diminish the electricity of the conductor. Hence the uninterrupted flow, without noise or much light, when the point is made very fine. When the point is blunt, a little accumulation is requisite before it attains the degree necessary for even this minute explosion; but this is soon done, and these little explosions succeed each other rapidly, accompanied by a sputtering noise, and trains of bright sparks. The noise is undoubtedly owing to the atoms of the highly electrified fluid. These are, in all probability, rarefied of a sudden, in the act of electrification, and immediately collapse again in the act of chemical union, which causes a sonorous agitation of the air. This electrified air is thus thrown off, and its place is immediately supplied by air from behind, not yet electrified, and therefore strongly drawn forward to the point, from which they were thrown off in their turn. This rapid expansion and subsequent collapsing of the air is verified by the experiments of Mr. Kinnersly, related by Dr. Franklin, and is seen in numberless experiments made with other views in later times, and not attended to. Perhaps it is produced by the great heat which accompanies, or is generated in the transference of electricity, and it is of the same kind with what occasions the bursting of stones, splitting of trees, exploding of metals &c. by electricity. The expansion is either inconsiderable, or it is successively produced in very small portions of the substance expanded; for when metal is exploded in close vessels, or under water, there is but a minute portion of gaseous matter produced; and in the dissipation by a very fine point, sufficiently great to give full employment to a powerful machine, the stream of wind is but very faint, and nine-tenths of this has been dragged along by the really electrified thread of wind in the middle.

From a collation of all the appearances of electricity, we must form the same conception of the forces which operate round a point that is negatively electrified, not dispersing, but drawing in electric fluid. It is more completely undercharged than any other part of a body, and attracts the fluid in the surrounding air, and the air in which it is retained, with incomparably greater force. It therefore deprives the contiguous air of its fluid, and then repels it, and then produces a stream like the overcharged point.

If a conducting body be brought near to any part of an overcharged body, the fronting part of the first is rendered undercharged; and this increases the charge of the opposite part of the overcharged body. It becomes more overcharged in that part, and sooner attains that degree of constipation that enables the fluid to quit the superficial series of particles, and to electrify strongly the contiguous air. The explosion is therefore made in this part in preference to any other; and the air thus exploded is strongly attracted by the fronting part of the other body, and must fly thither in preference to any other point. If, moreover, the fronting part of it be prominent or pointed, this effect will be produced in a superior degree; and the current of electrified air, which will begin very early, will increase this disposition to transference in this way, by rarefying the air; a change which the whole course of electric phænomena shews to be highly favourable to this transference, although we cannot, perhaps, form any very adequate notion how it contributes to this effect. This seems to be the reason why a great explosion and *snap*, with a copious transference of electricity, is generally preceded by a hissing noise like the rushing of wind, which swells to a maximum in the loud snap itself.

If two prominences, precisely similar, and electrified in the contrary way to the same degree, are presented to each other, we cannot say from which the current should take its commencement, or whether it should not equally begin from both, and a general dispersion of air laterally be the effect; but such a situation is barely possible, and must be infinitely rare. The current will begin from the side which has some superiority of propelling force. We are disposed to think that this current of material electrified substance must suffer great change during its passage, by mixing with the current in an opposite electrical state coming from the other body. Any little mass of the one current must strongly attract a contiguous mass of the other, and certain changes should surely arise from this mixture. These may, in their turn, make a great change in the mechanical motions of the air; and, instead of producing a quaquaversum dispersion of air from between the bodies, as should result from the meeting of opposite streams, it may even produce a collapsing of the air by the mutual strong attractions of the little masses. Many valuable experiments offer themselves to the curious enquirer. Two little balls may be thus presented to each other, and a smoke may be made with rosin to occupy the interval between them. Motions may be observed which have certain analogies that would afford useful information to the mechanical enquirer. There must be something of this mixture of currents in all such transferences, and the most minute differences in the condition of a little parcel of the air may greatly affect the future motions. The most promising form of such experiment would be to use two points of the same substance, shape, and size, and electrified to the same degree in opposite senses.

After all care has been taken to ensure similarity, there remains one essential difference, that the one current is redundant in electric fluid, and the other deficient. This circumstance must produce characterestic differences of appearance. And are there not such differences? Is not the pencil and the star of light a characteristic difference? And does not this well supported fact greatly corroborate the opinion of Dr. Franklin, that the electric phænomena result from the redundancy and deficiency of one substance, and not from two distinct substances operating in a similar manner? For the distinction in appearance is a mechanical distinction; in which are perceived motion, direction, velocity; and in which locomotive forces are concerned; but they are so implicated with forces which probably resemble chemical affinities, hardly operating beyond contact, that to extricate their effects from the complicated phænomenon, is a problem which, though not insurmountable, must not be entered into here; especially, as we have already extended this article to a greater length than we at first expected.

Mr. Cuthbertson, a very ingenious instrument-maker in London, gives the following account of an experiment by which the two kinds of electricity are distinguished, or the direction of the fluid is ascertained:—Insulate two wires, furnished at each end with a ball, three fourths of an inch in diameter; connect one with the positive, and the other with the negative, conductor of a machine; the balls should be *four* inches asunder, and between them, at equal distances from each, place a lighted candle with the centre of its flame nearly on a level with the centres of the balls: if the machine be put into motion, the flame will waver very much, and seem to incline rather more to the negative ball than to the positive one; after about fifty revolutions, the negative ball will grow warm, and the positive ball remain cold; if the revolution be continued to about 202, the negative ball will be too hot for the hand to touch, while the other remains as cold as at the beginning.

Notwithstanding the flattering testimony given by the great conformity of this doctrine of Franklin and Æpinus with the phænomena, we still choose to present it under the title of a hypothesis. We have never seen the electric fluid in a separate state; nor have we been able to say in what cases it abounds, or when it is deficient. After what we have seen in the late experiments of that philanthropic philosopher count Rumford on the production of heat by friction, we think that we cannot be too cautious on what grounds we admit invisible agents to perform the operations of nature. We think that all must acknowledge that those experiments tend very much to stagger our belief in the existence of a fluid *sui generis*, a fire, heat, caloric, or what we please to call it; and all will acknowledge, that no better proofs can be urged for the existence of an electric fluid.

Many acute and ingenious persons have started other theories; but we are not aware of any which need be mentioned here, except those of Mr. Russel, and M. de Luc. The former considered the electrical phænomena as the results of the action of a substance which may be called the electric fluid. The characteristic ingredient of this fluid, Mr. Russel thinks, is electricity properly so called: this is supposed to be united with the elastic fluid by chemical affinity, or elective attraction, as it was called by Dr. Cullen and Dr. Black; which attraction is thought to extend to all distances. The electricity, moreover, attracts the particles of other bodies, but with certain elections, according as the bodies attracted fall under the class of electrics, or of non-electrics. M. de Luc's theory does not differ very widely: he conceives that the electric phænomena are the operations of an expansive substance, called the electric fluid, which consists of two parts; the electric matter, which is the gravitating part of the compound; and electric deferent fluid, or carrying fluid, by which alone the electric matter seems to be carried from one body to another. This hypothesis is illustrated in Idees sur la Meteorologie, par de Luc: an account and examination of it may be seen in the article Electricity in the Supplement to the Encyclo. Britannica, where also is a very copious account of Æpinus's theory, from which we have drawn some of the above particulars.

To ELECTRIFY. *v. a.* To communicate the electric energy.

ELECTRIFICATION, or ELECTRISATION, the manner of electrifying bodies; that is, of exciting in them, or communicating to them, the electric virtue.

ELECTROMETER, (formed of ηλεκτρον, and μετρεω, I measure,) is an instrument contrived for measuring the quantity, and determining the quality of electricity in any electrified body. Mr. Canton, previous to the invention of instruments of this kind, estimated the quantity of electricity in a charged phial, by presenting the phial with one hand to an insulated conductor, and giving it a spark, which he took off with the other; and he proceeded in this manner till the phial was discharged, and then determined the height of the charge by the number of sparks.

The most simple electrometer is a linen thread, called by Dr. Desaguliers the thread of trial; which, if brought near to an electrified body, will be attracted by it; but this will do little more than determine, whether the body is in any degree electrified or not; without determining with any precision its quantity, much less its quality. The Abbé Nollet used two threads, and shewed the degrees of electricity by the angle of their divergency exhibited in their shadow on a board placed behind them.

Mr. Canton's electrometer consisted of two balls of cork, or pith of elder, nicely turned in a lathe to about the size of a small pea, and suspended on fine linen threads, about six inches long, which may be wetted in a weak solution of salt. See fig. 2, Plate 60.

These may be kept in small boxes, of the length of the strings, that they may lie in them without being bent; and they may be thus carried in the pocket, and will be ready for use. See POCKET ELECTROMETER.

If the box containing these balls be insulated, by placing it on a drinking glass, or any other electric substance, and an excited smooth glass tube be brought near them, they will first be attracted by it, and then repelled both from the glass, and from each other; but on the approach of excited wax, they will gradually approach and come together; and vice versa. This apparatus will also serve to determine the electricity of the clouds and air, by holding them at a sufficient distance from buildings, trees, &c.; for if the electricity of the clouds or air be positive, their mutual repulsion will increase by the approach of excited glass, or decrease by the approach of amber or sealing-wax; on the contrary, if it be negative, their repulsion will be diminished by the former, and increased by the latter. See Philos. Trans. vol. xlviii. part 1 and 2, for an account of Mr. Canton's curious experiments with this apparatus.

If two balls of this kind be annexed to a prime conductor, they will serve to determine both the degree and quality of its electrification, by their mutual repulsion and divergency.

The Discharging Electrometer, fig. 1, Plate 60, was invented by Mr. Lane. It consists of brass work G, the lower part of which is inclosed in the pillar F, made of baked wood, and boiled in linseed oil, and bored cylindrically about two-thirds of its length; the brass work is fixed to the pillar by the screw H, moveable in the groove I; and through the same is made to pass a steel screw L, to the end of which, and opposite to K, a polished hemispherical piece of brass, attached to the prime conductor, is fixed a ball of brass M well polished. To this screw is annexed a circular plate O, divided into twelve equal parts. The use of this electrometer is to discharge a jar D, or any battery connected with the conductor, without a discharging rod, and to give shocks successively of the same degree of strength; on which account it is very fit for medical purposes. Then, if a person holds a wire fastened to the screw H in one hand, and another wire fixed to E, a loop of brass wire passing from the frame of the machine to a tin plate, on which the phial D stands, he will perceive no shock, when K and M are in contact; and the degree of the explosion, as well as the quantity of electricity accumulated in the phial, will be regulated by the distance between K and M. Philos. Trans. vol. lvii. p. 451. Mr. Henley much improved Mr. Lane's electrometer, by taking away the screw, the double milled nut, and the sharp-edged graduated plate, and adding other contrivances in their stead. Mr. Henley's discharger of this kind has two tubes, one sliding within the other, to lengthen and accommodate it to larger apparatus.

The Quadrant Electrometer of Mr. Henley consists of a stem, terminating at its lower end with a brass ferrule and screw, for fastening it upon any occasion; and its upper part ends in a ball. Near the top is fixed a graduated semicircle of ivory, on the centre of which the index, being a very light rod with a cork ball at its extremity, reaching to the brass ferrule of the stem, is made to turn on a pin in the brass piece, so as to keep near the graduated limb of the semicircle. When the electrometer is not electrified, the index hangs parallel to the stem; but as soon as it begins to be electrified, the index, repelled by the stem, will begin to move along the graduated edge of the semicircle, and so mark the degree to which the conductor is electrified, or the height to which the charge of any jar or battery is advanced.

Cuthbertson's Electrometer is thus described by himself in the last number of the second volume of Nicholson's Philosophical Journal, 4to. GH (fig. 4, Plate 60), is an oblong piece of wood, about eighteen inches in length, and six in breadth, in which are fixed three glass supporters, D, E, F, mounted with brass balls, *a*, *e*, *b*. Of these supporters E and F are exactly of the same length; but D is four inches shorter. Under the brass ball *a* is a long brass hook; the ball *c* is made of two hemispheres, the under one being fixed to the brass mounting, and the upper turned with a groove to shut upon it, so that it can be taken off at pleasure. The ball *b* has a brass tube fixed to it, about three inches long, cemented on the top of F, and the same ball has a hole at the top, of about one-half inch diameter, corresponding with the inside of the tube. AB is a straight brass wire, with a knife-edged centre in the middle, placed a little below the centre of gravity, and equally balanced with a hollow brass ball at each end, the centre, or axis, resting upon a proper shaped piece of brass fixed in the inside of the ball *c*; that side of the hemisphere towards *c* is cut open, to permit the end *c*A of the balance to descend till it touches the ball *a*, and the upper hemisphere C is also cut open to permit the end *c*B to ascend; *i* is a weight, weighing a certain number of grains, and made in the form of a pin with a broad head; the ball B has two holes, one at the top, and the other at the bottom; the upper hole is so wide, as to let the head of the pin pass through it, but to stop at the under one, with its shank hanging freely in *b*; *k* is a common Henley's quadrant electrometer; and when in use it is screwed upon the top of *c*.

It is evident, from the construction, that if the foot stand horizontal, and the ball B be made to touch *b*, it will remain in that position without the help of the weight *i*; and if it should by any means receive a very low charge of electric fluid, the two balls *b*, B, will repel each other; B will begin to ascend, and, on account of the centre of gravity being above the centre of motion, the ascension will continue till A rest upon *a*. If the balance be set again horizontal, and the pin *i* be put into its place in B, it will cause B to rest upon *b*, with a pressure equal to that weight, so that more electric fluid must be communicated than formerly before the balls will separate; and as the weight in B is increased or diminished, a greater or less quantity of electric fluid will be required to effect a separation.

When this instrument is to be applied to a jar, or battery, one end of a wire L must be inserted into a hole in *b*, and the other end into a hole of any ball proceeding from the inside of a battery, as M. A chain, or wire, or any body through which the charge is to pass, must be hung to the hook at *m*, and carried from thence to the outside of the battery, as is represented by the line N. *k* must be screwed upon *c*, with its index towards A. The reason of this instrument being added, is to shew, by the index continuing to rise, that the charge of the battery is increasing, because the other part of the instrument does not act till the battery has received its required charge.

It is almost needless to observe, that this instrument consists of three electrometers, viz. Henley's electrometer, Lane's discharging electrometer considerably improved, and Brookes's steelyard electrometer improved likewise. By this combination and these improvements, we possess all that can be required in an electrometer for batteries and large jars; for, by *k*, we see the progress of the charge; by the separation of B*b*, we have the repulsive power in weight; and by the ball A, the discharge is caused when the charge has acquired the strength proposed.

In the journal from which this abstract is taken, the reader will find some curious experiments made with batteries by means of this electrometer; but one will be sufficient to explain its use. Prepare the electrometer in the manner shewn in the figure, with the jar M annexed, which contains about 168 square inches of coating. Take out the pin in B, and observe whether the ball B will remain at rest upon *b*; if not, turn the adjusting screw at C till it just remains upon A. Put into B the pin, marked *i*, weighing fifteen grains; take two inches of watch pendulum wire, fix to each end a pair of spring tongs, as is represented at G*m*, hook one end to *m*, and the other to the wire N, communicating with the outside of the jar; let the uncoated part of the jar be made very clean and dry; and let the prime conductor of an electrical machine, or a wire proceeding from it, touch the wire L; then, if the machine be put in motion, the jar and electrometer will charge, as will be seen by the rising of the index of *k*; and when charged high enough, B will be repelled by *b*, and A will descend and discharge the jar through the wire which was confined in the tongs, and the wire will be fused and run into balls. The ingenious author, by breathing through a glass pipe into the jar, damped it a little in the inside. Then loading B with a pin of thirty grains, he obtained such a charge as fused eight inches of watch-pendulum wire, disposed exactly as the two inches were disposed in the former experiment. By repeating and varying his experiments, he found that double quantities of electrical fluid, in the form of a discharge, will melt four times the length of wire of a certain diameter.

Mr. Cavallo likewise contrived several ingenious electrometers, for different uses: descriptions of them may be seen in his Treatise on Electricity, and in Phil. Trans. vol. lxvii. And Mr. Coulumb, of the Royal Acad. Scien. Paris, invented a very accurate and delicate instrument, but, as hitherto managed, it measures only repulsions: it is described in the first volume of Gregory's Translation of Haüy's Natural Philosophy.

ELECTROMICROMETER, the name given to an instrument invented by Vean de Launay, to indicate the smallest appreciable quantities of Galvanic energy. See GALVANISM.

ELECTROPHORUS, a machine, represented in Plate 60, fig. 3, the phænomena of which are somewhat singular. It consists of two plates, A and B, usually of a circular form; though they may be made square, or of the figure of a parallelogram, with more ease, and with equal advantage. At first the under plate was of glass, covered over with sealing wax; but there is little occasion for being particular either with regard to the substance of the lower plate, or the electric which is put upon it. A metallic plate, however, is perhaps preferable to a wooden one, though the latter will answer the purpose very well. This plate is to be covered with some electric substance. Pure sulphur answers very near as well as the dearer electrics, sealing-wax, gum-lac, &c.; but it hath this bad quality, that, by rubbing it, some exceeding subtle streams are produced, which infect the person's clothes, and even his whole body, with a very disagreeable smell, and will change silver in his pocket to a blackish colour. The upper plate of the electrophorus is a brass plate, or a board or piece of pasteboard covered with tinfoil or gilt paper, nearly of the same size with the electric plate, though it will not be the worse that it is somewhat larger. It is furnished with a glass handle (I), which ought to be screwed into the centre. The manner of using this machine is as follows. First, the plate B is excited by rubbing its coated side with a piece of new white flannel, or a piece of hare's skin. Even a common hard brush, having the hair a little greased, will excite sulphur extremely well. When this plate is excited as much as possible, it is set upon the table with the electric side uppermost. Secondly, the metal plate is laid upon the excited electric, as represented in the figure. Thirdly, the metal plate is touched with the finger or any other conductor, which, on touching the plate, receives a spark from it. Lastly, the metal plate A, being held by the extremity of its glass handle (I), is separated from the electric plate; and, after it is elevated above that plate, it will be found strongly electrified with an electricity contrary to that of the electric plate; in which case, it will give a very strong spark to any conductor brought near it. By setting the metal upon the electric plate, touching it with the finger, and separating it successively, a great number of sparks may be obtained apparently of the same strength, and that without exciting again the electric plate. If these sparks are repeatedly given to the knob of a coated phial, this will presently become charged.

Mr. Cavallo, in his account of the electrophorus, tells us, "that instead of laying the electric plate upon the table, it is set upon an electric stand, so as to be accurately insulated, then the metal plate set on it acquires so little electricity, that it can only be discovered by an electrometer." In what manner this gentleman came to mistake a plain fact so egregiously, is not easy to determine; but it is certain, that an electrophorus, instead of having its virtue impaired by being insulated, has it greatly increased, at least the sphere of its activity is greatly enlarged. When lying on the table, if the upper plate is put upon it without being touched with the finger, it will not shew much sign of electricity. But as soon as it is put on the electric stand, both the upper and under side appear strongly negative. A thread will be attracted at the distance of eight or ten inches. If both the upper and under side are touched at the same time, a strong spark will be obtained from both, but always of the same kind of electricity, namely, the negative kind. If the upper plate is now lifted up, a strong spark of positive electricity will be obtained from it; and on putting it down again, two sparks of negative electricity will be produced.

The singularity of this experiment is, that it produces always double the quantity of negative electricity that it doth of the positive kind; which cannot be done by any other method yet known. Another very surprising circumstance is, that when the electrophorus remains in its insulated situation, you need not always touch the upper and under side of the plates at once, in order to procure positive electricity from the upper plate: it is sufficient to touch both sides only once. On lifting up the upper plate, a spark of positive electricity is obtained as already mentioned. On putting it down again, a spark of the negative kind is obtained from the upper plate, even though you do not touch the lower one. On lifting up the upper plate, a spark of positive electricity is obtained, but weaker than it would have been had both sides been touched at once. Putting down the upper plate again without touching both, a still weaker spark, first of negative and then of positive electricity, will be obtained from the upper one. Thus, the sparks will go on continually diminishing, to the number perhaps of two or three hundred. But at last, when the electricity of the whole machine seems to be totally lost, if both sides are touched at once, it will instantly be restored to its full strength, and the double spark of negative, with the single one of positive electricity, will be obtained without intermission as before.

ELECTRUM. (*electrum*, ηλεκτρον.) The ancient name of amber.

ELECTUARIUM CASSIÆ, in pharmacy. A very elegant, pleasant, and mild aperient, calculated for the feeble and for children.

ELECTUARIUM CATECHU. A very useful adstringent, and, perhaps, the most efficacious way of giving the catechu to advantage. Ten scruples of this electuary contain one grain of opium.

ELECTUARIUM OPIATUM, in pharmacy. This preparation, ordered in the Edinburgh pharmacopœia, is an excellent aromatic adstringent, and calculated for the debilitated, the aged, and nervous. One grain of opium is contained in about a drachm.

ELECTUARIUM SCAMMONII, in pharmacy. This is a strong stimulating cathartic, and calculated to remove worms from the primæ viæ, with which view it is mostly exhibited.

ELECTUARIUM E SENNÆ, in pharmacy. A mild and elegant aperient: well adapted for pregnant women, and those whose bowels are easily moved.

ELECTUARY. (*electuarium*, from *eligo*, to choose.) A medicine containing several ingredients that are mixed together by a fluid into the consistence of honey.

ELEEMOSYNA CARUCARUM, or ELEEMOSYNA REGIS, a penny which king Ethelred ordered to be paid for every plough in England towards the support of the poor.

ELEEMOSYNARIUS, in our old writers, is used for the almoner in religious houses.

ELEEMO'SYNARY. *a.* (ελεημοσυνη.) 1. Living upon alms; depending upon charity: not used (*Glanville*). 2. Given in charity.

E'LEGANCE. E'LEGANCY. *s.* (*elegantia*, Lat.) 1. Beauty without grandeur (*Raleigh*). 2. Any thing that pleases by its nicety (*Spectator*).

E'LEGANT. *a.* (*elegans*, Latin.) 1. Pleasing by minuter beauties (*Pope*). 2. Nice; not coarse; not gross (*Pope*).

E'LEGANTLY. *ad.* (from *elegant*.) 1. In such a manner as to please (*Milton*). 2. Neatly; nicely; with minute beauty (*Pope*).

ELEGI'ACK. *a.* (*elegiacus*, Latin.) 1. Used in elegies. 2. Mournful; sorrowful (*Guy*).

ELEGY. (Ελεγεια.) A mournful and plaintive kind of poem. Vossius, after Didymus, derives the term from ε, ε, λεγειν, to say alas!

The first inventor of the elegy is not known: some say it was one Theocles of Naxus, or, according to others, of Eretria, who, in the heat of his phrensy, first produced this kind of composition. But there is no wonder that we are at this time in the dark as to the matter; Horace assures us it was a point not settled among the grammarians even in his time, who the author was.

> "Quis tamen exiguos elegos emiserit auctor,
> Grammatici certant, & adhuc sub judice lis
> est."

The chief writers of elegy among the Greeks, are Callimachus, Parthenius, and Euphorion; and among the Latins, Ovid, Catullus, Tibullus, and Propertius.

As elegy, at its first institution, was intended for tears, it expressed no other sentiments, it breathed no other accents, but those of sorrow. With the negligence natural to affliction, it sought less to please than to move. By degrees, however, elegy degenerated from its original intention, and was employed upon all sorts of subjects, gay or sad, and especially upon love.

Ovid's books of love, the poems of Tibullus and Propertius, are entitled elegies; and yet so far are they from being sad, that they are sometimes scarce serious: so that the same title was indiscriminately given to poems on different subjects, but which agreed in their verse and manner of writing. The chief subjects to which elegy owes its rise, are Death and Love: so that elegy ought to be esteemed the most perfect, which has somewhat of both at once; namely, where the poet bewails the loss of some youth, or damsel, falling a martyr to love. The next are those elegies full of that melancholy complaint which lovers seldom want matter for: the thoughts of elegy should be always natural, far from the affectation of wit; its sentiments tender and delicate; its expression simple and easy, always retaining that alternate inequality of measure which Ovid extols so much; and which gives the elegiac poetry of the ancients so much the advantage over the moderns. Elegy should flow in one even current, smooth, humble, and unaffected; and yet she is not abject in her humility, but becoming, elegant, and attractive.

The office of elegy is well delivered by M. Boileau:

> "La plaintive elegie en long habits de deuil,
> Seait, les cheveux epars, gemir sur un cercueil:
> Elle peint des aimans la joye, & la tristesse;
> Flate, menace, irrite, appaise une maîtresse."
>
> In mourning weeds sad elegy appears,
> Her hair dishevell'd, and her eyes in tears:
> Her theme, the lover's joys, but more his pains;
> By turns she sings, sooths, threatens, and complains.

Among the ancients, hexameters and pentameters were so peculiar to elegy, that this kind of metre is usually styled elegiac. Instead of it, we, in our tongue, use the word heroic.

E'LEMENT. *s.* (*elementum*, Latin.) 1. The first or constituent principle of any thing (*Hooker*). 2. The four elements, usually so called, are earth, fire, air, and water (*Bacon*). 3. The proper habitation or sphere of any thing (*Baker*). 4. An ingredient; a constituent part (*Shakspeare*). 5. The letters of any language. 6. The lowest or first rudiments of literature or science (*Hooker*).

ELEMENTS, in astronomy, principles and numbers deduced from observations, and made the basis in the construction of tables of the planetary motions. Such are, the time of a planet's revolution; the position of the line of apsides, and the epoch of a passage through that line; the place of the nodes, and an epoch; the eccentricity of the orbit, or the relation of its axes; and the inclination of the orbit.

ELEMENT, in physiology, a term used by philosophers to denote the original component parts of bodies, or those into which they are ultimately resolvable.

It seems to have been an opinion established among philosophers in the remotest ages, that there are only four simple bodies; namely, fire, air, water, and earth. To these they gave the name of elements, because they believed that all substances are composed of these four. This opinion, variously modified indeed, was maintained by all the ancient philosophers. We now know that all these supposed elements are compounds: fire is composed of caloric and light; air of caloric, oxygen, and azotic gases; water of oxygen and hydrogen; and that earth includes nine different substances.

The doctrine of the four elements seems to have continued undisputed till the time of the alchemists. These men having made themselves much better acquainted with the analysis of bodies than the ancient philosophers had been, soon perceived that the common doctrine was inadequate to explain all the appearances that were familiar to them. They substituted a theory of their own in its place. According to them, there are three elements, of which all bodies are composed; namely, salt, sulphur, and mercury, which they distinguish by the appellation of the tria prima. These principles were adopted by succeeding writers, particularly by Paracelsus, who added two more to their number; namely, phlegm and caput mortuum.

It is not easy to say what the alchemists meant by salt, sulphur, and mercury; probably they had affixed no precise meaning to the words. Every thing which is fixed in the fire they seem to have called salt, every inflammable substance they called sulphur, and every substance which flies off without burning was mercury. Accordingly they tell us, that all bodies may by fire be decomposed into these three principles; the salt remains behind fixed, the sulphur takes fire, and the mercury flies off in the form of smoke. The phlegm and caput mortuum of Paracelsus were the water and earth of the ancient philosophers.

Mr. Boyle attacked this hypothesis in his Sceptical Chemist, and in several of his other publications; proving that the chemists comprehended under each of the terms salt, sulphur, mercury, phlegm, and earth, substances of very different properties; that there is no proof that all bodies are composed of these principles; and that these principles themselves are not elements but compounds. The refutation of Mr. Boyle was so complete, that the hypothesis of the tria prima seems to have been almost immediately abandoned by all parties.

Elements. Radicals. First principles. The minutest particles of any substance, which can no further be divided or decomposed by chemical analysis. Many substances cannot be farther decomposed by the chemist into constituent parts, but this alone does not entitle them to be ranked among the elements. Though they are not yet decomposed, it does not follow that they are undecomposable, but only, perhaps, that we have neither instruments nor means by which to produce a decomposition, nor senses to notice it when it has taken place. The bodies which are known to us at present, however, as simple substances, amount to forty-one; some of these may be sensibly exhibited in their simple state, uncombined with other matters: these are termed ostensible, producible, simple substances, to distinguish them from those whose existence or presence is only inferred from facts, and are called unostensible, unproducible, simple substances. The following is a list of simple substances at present known.

Unproducible simple Substances.

1. Phlogiston, or basis of light.
2. Oxygen.
3. Hydrogen.
4. Azotic. }
5. Carbonic. } Rad.

6. Sulphur. }
7. Phosphor. }
8. Muriatic. }
9. Fluoric. }
10. Boracic. } Radical.
11. Rad. of gold.

12. Rad. of platina.
13. —— silver.
14. —— mercury.
15. —— lead.
16. —— copper.
17. —— iron.
18. —— tin.
19. —— zinc.
20. —— bismuth.
21 —— antim.

22. Rad of nickel.
23. —— cobalt.
24. —— arsenic.
25. —— mangan.
26. —— molybd.
27. —— wolfranc.
28. —— uranium.
29. —— titanium.
30. —— tellurium.
31. —— chrome.

Producible, ostensible, simple Substances.

32. Caloric.
33. Siliceous. }
34. Calcar. }
85. Magnesi. }
36. Ponder. } Earth.

37. Strontian. }
38. Argillac. }
39. Glucine. } Earth.
40. Vegetab. }
41. Mineral. } Alk.

Elements, a term also used for the first grounds and principles of arts and sciences; as the elements of geometry, elements of mathematics, &c. So Euclid's Elements, or simply the Elements, as they were anciently and peculiarly named, denotes the treatise on the chief properties of geometrical figures by that author.

The Elements of Mathematics have been delivered by several authors in their courses, systems, &c. The first work of this kind is that of Herigon, in Latin and French, and published in 1664, in ten tomes; which contains Euclid's Elements and Data, Apollonius, Theodosius, &c.; with the modern elements of arithmetic, algebra, trigonometry, architecture, geography, navigation, optics, spherics, astronomy, music, perspective, &c. The work is remarkable for this, that a kind of real and universal characters are used throughout; so that the demonstrations may be understood by such as only remember the characters, without any dependence on language or words at all.

Since Herigon, the elements of the several parts of mathematics have been also delivered by others; particularly the Jesuit Schottus, in his Cursus Mathematicus, in 1674; De Chales, in his Cursus, 1674; sir Jonas Moore, in his New System of Mathematics, in 1681; Ozanam, in his Cours de Mathematique, in 1699; Jones, in his Synopsis Palmariorum Matheseos, in 1706; and many others, but above all, Christ. Wolfius, or Wolf, in his Elementa Matheseos Universæ, in two vols. 4to. the first published in 1713, and the second in 1715; a very excellent work of the kind. Another edition of the work was published at Geneva, in five vols. 4to. of the several dates 1732, 1733, 1735, 1738, and 1741.

Other good elementary systems of mathematics, are those of Bezout, Emerson, Hutton, Dalby, Vince, and Wood, Bossut, and Lacroix.

The Elements of Euclid, as they were the first, so they continue still the best system of geometry, are in fifteen books. There have been numerous editions and commentaries of this work. Proclus wrote a commentary on it. Orontius Fineus first gave a printed edition of the first six books, in 1530, with notes, to explain Euclid's sense. Peletarius did the same in 1557. Nic. Tartaglia, about the same time, made a comment on all the fifteen books, with the addition of many things of his own. And the same was also done by Billingsley in 1570; and by Flussates Candalla, a noble Frenchman, in the year 1578, with considerable additions as to the comparison and inscriptions of solid bodies; which work was afterwards republished with a prolix commentary, by Clavius. Other editions are mentioned under the word Euclid.

To **E'lement.** *v. a.* (from the noun.) 1. To compound of elements (*Boyle*). 2. To constitute; to make as a first principle (*Donne*).

ELEME'NTAL. *a.* (from *element.*) 1. Produced by some of the four elements (*Dryden*). 2. Arising from first principles (*Brown*).

ELEMENTA'RITY. *s.* (from *elementary.*) The simplicity of nature, or absence of composition: being uncompounded (*Brown*).

ELEME'NTARY. *a.* (from *element.*) 1. Uncompounded; having only one principle or constituent part (*Arbuthnot*). 2. Initial; rude.

ELEMI. (*elemi*; it is said this is its Ethiopian name.) Gum elemi. The parent plant of this resin is supposed to be the amyris elemifera; foliis ternis quinato-pinnatisque subtus tomentosis, of Linnéus. (See Amyris, as also Gardenia, one or two species of which secrete a similar resin.) See also Pistacia. Elemi is brought here from the Spanish West Indies: it is most esteemed when softish, somewhat transparent, of a pale whitish colour, inclining a little to green, and of a strong, though not unpleasant smell. It is only used in ointments and plasters, and is a powerful digestive.

ELENCHUS, in antiquity, a kind of earrings, set with large pearls.

Elenchus, in logic, a sophism.

ELEPHANT, in mastiology. See Elephas.

Elephant (American). See Mammoth.

Elephant's foot, in botany. See Elephantopus.

Elephant (Knights of the), an order of knighthood in Denmark, conferred upon none but persons of the first quality and merit. It is also called the order of St. Mary. Its institution is said to have been owing to a gentleman among the Danish croisees having killed an elephant, in an expedition against the Saracens, in 1184; in memory of which king Canutus instituted this order, the badge of which is a towered elephant, with an image of the Holy Virgin encircled with rays, and hung on a watered sky-coloured ribbon, like the George in England.

Elephant's tusks, in oryctology. See Zoolithus

Elephant (Beetle). See Scarabœus.

ELEPHANTA, an island on the Malabar coast, in the East Indies, eight miles from the island of Bombay, which had its name from the figure of an elephant, carved out of stone, the natural size and colour of that animal.

ELEPHANTI'ASIS. (*elephantiasis*, ελεφαντιασις, from ελεφας, an elephant: so named from the legs of people affected with this disorder growing scaly, rough, and wonderfully large, like the legs of an elephant.) Elephas. Leprosy of the Arabians. A disease that mostly affects the feet, which appear somewhat like those of the elephant. It is known by the skin being thick, rough, wrinkly, unctuous, and void of hair, and mostly without the sense of feeling. It is said to be contagious. Cullen makes it a genus of disease in the class cachexiæ, and order impetigines.

ELEPHA'NTINE. *a.* (*elephantinus*, Lat.) Pertaining to the elephant.

Elephantine, in Roman antiquity, an appellation given to the books wherein were registered the transactions of the senate and magistrates of Rome, of the emperors or generals of armies, and even of the provincial magistrates; the births and classes of the people, and other things relating to the census. They are supposed to have been so called, as being made of leaves of ivory or elephant's tusks.

ELEPHANTO'PUS. Elephant's foot. Bastard scabius. In botany, a genus of the class syngenesia, order polygamia segregata. Calycle four-flowered; florets tongue-shaped, all hermaphrodite; receptacle naked; down bristly. Six species; one an oriental herbaceous plant; the rest West Indian.

ELEPHAS, Elephant, in zoology, a genus of the class mammalia, order bruta. Foretoothless in both jaws; tusk in the upper jaw elongate; tuskless in the lower; proboscis very long, prehensile; body nakedish. One species only, the largest of quadrupeds; sometimes weighing four thousand five hundred pounds; body cinereous, seldom reddish or white, thinly set with hairs; proboscis flat beneath, tip truncate; eyes small; tusks, which are only in the upper jaw, far extended beyond the mouth, resembling horns, marked with curled fibres, constituting the ivory of the shops, and sometimes weighing a hundred and fifty pounds each; ears large, pendulous, dentate; skin thick, callous, impenetrable by musket balls, and yet sensible of the sting of flies; teats two, near the breast; knees flexible; neck short; hoofs five on each fore-foot, four on each hind-foot.

Some writers have made the sukotyro a second species of the elephant: but incorrectly. He has a distinguishing property that ought to constitute him a distinct genus. See Sukotyro.

The elephant inhabits the torrid zone, in swampy places, and by the sides of rivers; feeds on the leaves and branches of young trees, particularly plantains, eating even the wood; devours grain voraciously; is gregarious, docile, long-lived, and sagacious, though the brain is small; hereby confuting the doctrine of those philosophers who contend that the intellect possessed depends upon the size of the brain compared with the size of the animal; drawing their doctrine from the human form and human brain alone.

The proboscis is long, extensile, contractile; furnished at the end with a hook, serving the purpose of a hand; with which it takes its food and drink; and which being cut off, the animal perishes. He is afraid of mice, lest when he sleeps they should creep into his trachea; urines backwards; copulates like other quadrupeds. The female is gravid a year; the young suck the mother with their lips. Carries houses on its back, its guider sitting upon the neck; moves quickly; swims dexterously; is armed for war by the natives of India; and was formerly armed by the Romans with scythes. The contrivances for taking wild elephants are various: the two most common are decoying them into places of security by means of female elephants properly instructed; and hunting, or rather frightening them forwards from one part of the wood to another, till they reach their place of imprisonment, which is strongly palisadoed all round, with a view of escaping from the noise, and torches employed on such occasions. When once they are caught, they are easily tamed, by observing the submission of other elephants. See Nat. Hist. Plate LXXXVIII.

The Ceylonese elephants are those most highly esteemed in India; and the mode of snaring them is peculiarly entertaining and curious. In Mr. Cordiner's Description of

Ceylon, there is a good account of this extraordinary decoy, and we shall present our readers with it, in as condensed a form as possible. The hunt alluded to took place near the elephant snare at Kotaway, only a few miles distant from Tengalle. The governor and his suite attended on this occasion, and the whole of the party employed was not fewer than three thousand persons. The whole of this multitude surrounded the forests in which elephants are discovered to abound, with a chain of fires placed on moveable stands, so as to be brought closer, according as the elephants are driven nearer to the centre. The distance between the fires may at first have been an hundred paces, which is gradually reduced to about ten paces. The more the elephants are confined, the more vigilant the hunters must become, and prepared to repel their efforts to escape, by advancing the fires, and by loud shouting. At the end of two months, they thus become enclosed in a circle, of which the wide entrance of the snare forms a part, and are at last brought so near to it, that by the exertions of the surrounding multitude, they can be made close prisoners in a few hours. It is now that all those who are desirous of witnessing the capture resort to the scene of action.

An idea of the enclosure may be formed by drawing, on a piece of paper, the outline of a wide funnel. A little way within the wide end, a palisade runs across, in breadth six hundred feet, containing four open gates, at which the elephants enter. A view of two of these is commanded from bungaloe, erected for spectators on pillars thirty feet from the ground. The enclosure is formed of the strongest trees on the island, from eight to ten inches in diameter, bending inwards, sunk four feet into the ground, and from sixteen to twenty feet high above it. They are placed at the distance of sixteen inches from each other, and crossed by four rows of powerful beams, bound fast to them with pliant canes. To this palisade are added supporters more inclined, several feet asunder, augmenting the strength of the fence. The part of it in which the elephants are first enclosed, is eighteen hundred feet in circumference; but it communicates with a smaller fold, one hundred feet in length, and forty broad, through which a rivulet passes, five feet in depth, and nearly fills the enclosure. The elephants enter this place of confinement at only one gate; and beyond the water the fence gradually contracts, terminating in a strong passage, five feet broad, and one hundred feet long.

We give likewise, in our author's own words, the striking picture of the entrance of the elephants into the first snare.

"All things being ready for driving the elephants into the snare, the governor and his party repaired to the ground about seven o'clock in the evening, ascended the elevated bungaloe by a long ladder, and waited several dark and tedious hours; but the termination of the chase amply repaid their patience. It was necessary that silence as well as darkness, should reign amongst us; and, in a situation where our eyes and ears were otherwise so attentively engaged, conversation would have been particularly irksome. The shouting of the hunters was incessant, muskets and rockets joined in the chorus, and the wild roaring of the elephants was heard at intervals, more distinctly warning us of their approach. At length the forest crashed, and the enormous herd pushed forward with fury, levelling instantaneously every tree which opposed their passage. The following up of the people with the lights and fire works was truly grand. Every man waved in his hand a blazing torch, formed of a bundle of reeds, the feeble but effectual means of defence against a tremendous foe. The trees were nobly illuminated, and, towering aloft amidst the surrounding darkness, spread their glittering foliage in the air."

When the first enclosure is completely stocked, the four gates are closed, and secured with strong stakes. Then another chain of fires and torches is formed within the enclosure, and the persecuted animals are driven forward in like manner into the smaller fold.

The line of flame once more began its terrifying movement. The people resumed their tumultuous noise, mingled with the din of trumpets, drums, and arms. The affrighted herd, again annoyed with impending horrors, renewed their tremendous flight; and rushing like an agitated torrent into the water snare, experienced still greater sorrows. As soon as seventy elephants had found their way into this place, it being sufficiently crammed, the cords were cut, and the barricading gate dropped down. The greater part of those which had entered were so closely wedged together, that many of them were motionless; and even the foremost, which were less confined, saw only a fallacious opening to lead them from this doleful labyrinth. Upwards of one hundred of the captured herd, cut off from their companions, were left for a time to range at greater liberty in the larger prison.

All this took place during the night.

"At sunrise, (continues Mr. Cordiner), we became spectators of a most extraordinary sight. So great a number of enormous animals crowded into so small a compass, is a spectacle rarely to be seen. Pressing heavily upon one another, incapable of almost any movement but convulsions of distress, their paroxysms of anguish could not be contemplated without emotion. No person could find language to express his feelings. All were struck dumb with a species of astonishment hitherto unexperienced. The most hazardous part of the business remains, that of seizing on the elephants at the end of the long passage, which is the only outlet from the water snare. They are driven in one by one, making furious efforts to regain their liberty on finding themselves prisoners. When they reach the gate at the end, strong beams are inserted across the passage behind, to prevent them from retreating. Men then approach, and bind their hind legs with great ropes, and five or six turns of smaller cordage are passed round their necks. While these operations are going on, a man stands before the gate of the passage, tickling the elephant's trunk, and diverting his attention. In this manner they are secured, yet accidents frequently happen at this time. On the present occasion, one unfortunate man tumbled into the passage, and was instantly trampled to death under the feet of an enraged elephant. They frequently press against one another in the water snare and the passage with so much violence, that some are squeezed to death, or drop down dead with fatigue."

When the wild elephant is completely harnessed, two tame elephants, trained to the business, are brought to the gate, and placed one on each side of it. These immediately survey the prisoner whom they have to conduct, feel his mouth to know whether or not he has tusks, and lay hold of his proboscis to ascertain what degree of resistance he is likely to make. Ropes are passed through the collar of the wild elephant, and made fast to similar collars on each side of the tame ones. The bars of the gate are then unloosed, and drawn out; and the wild captive darts forward directly between the two tame elephants: he can, however, only advance a little way, as the ropes securing his hind legs still continue fastened to the strong stakes of the toil. In this situation he remains, until the riders mounted on the tame elephants have drawn tight the cords, which bind him to the necks of his half reasoning conductors.

During this operation, he endeavours to undo with his trunk some of the knots which have been made, and often attempts to give a destructive blow to the diminutive creatures so actively engaged in confirming his captivity. But the two tame animals, who are vigilantly observant of all his motions, never fail to prevent him from doing any mischief, by gently lowering his proboscis with their own: if he continue long refractory, they batter him with their heads, and at last produce the most obsequious submission. The nooses of the ropes are then opened, leaving his hind legs at freedom, and himself entirely disengaged from the snare. The two tame elephants press close on each side of him, and proceed, in pompous procession, to the garden of stalls, where they deliver up their charge to experience another species of hardships. The marching off of this venerable trio is a sight truly magnificent, and exhibits a noble specimen of the skill of man, united with the sagacity of the elephant.

In this manner the prisoner is conducted to a grove, where, if he is of an ordinary size, he is sufficiently secured by being placed lengthways between two trees, to one of which his hind legs are bound, and one of his fore legs to the other. A more complicated apparatus of ropes and stakes is necessary for those which are remarkable for strength and fury. The tame conductors then move away to secure another captive. An elephant may frequently be tamed in eight or ten days, though in other instances, months are required. When tamed, they are marched round to Jaffnapatam, there sold by public auction, and thence exported to the opposite continent.

For many other curious particulars relative to the habits, manners, mode of dentition, and natural history of elephants, the reader may consult two memoirs by John Corse, esq. in the lxxxixth vol. of the Philosophical Transactions, or p. 444, 509, vol. xviii. of the New Abridgment of the Transactions, just completed by Drs. Hutton, Shaw, and R. Pearson.

ELEOSELI'NUM. (*eleoselinum*, ελεοσελινον, from ελος, a lake, and σελινον, parsley.) See APIUM.

ELETTARI PRIMUM. See AMOMUM VERUM.

To E'LEVATE. *v. a.* (*elevo*, Latin.) 1. To raise up aloft (*Woodward*). 2. To exalt; to dignify. 3. To raise with great conceptions (*Milton*). 4. To elate with vitious pride (*Milton*). 5. To lessen by detraction: not in use (*Hooker*).

E'LEVATE. *part. a.* Exalted; raised aloft (*Milton*).

ELEVA'TION. *s.* (*elevatio*, Lat.) 1. The act of raising aloft (*Woodward*). 2. Exaltation; dignity (*Locke*). 3. Exaltation of the mind by noble conceptions (*Norris*). 4. Attention to objects above us (*Hooker*). 5. The height of any heavenly body with respect to the horizon (*Brown*).

ELEVATION, in architecture, a draught of the principal face of a building.

ELEVATION OF THE POLE, in astronomy, is the altitude of that pole of the equator which is above the horizon: it is always equal to the latitude of the place of observation: and the complement of this is, the elevation of the equator, i. e. an arch of the meridian, between the equator, and the horizon of the place.

Apparent elevation of objects, whether celestial or terrestrial, is generally different from the real elevation. Celestial objects appear lower than they really are, on account of parallax (where the parallax is sensible); and they appear higher than they are in reality, on account of refraction; and where great accuracy is required, allowances must be made on both these accounts. Terrestrial objects also appear higher on account of refraction; and the increase of elevation occasioned by refraction is such, that the distance at which an object can be seen by refraction, is to the distance at which it could be seen without refraction (at a mean) as 14 to 13. It is well known, likewise, that on the borders of lakes, the banks of broad rivers, and the shore of bays, when the spectator is stationed in a high point of view, the opposite bank, with trees, &c. are seen as it were floating in the air. This phænomenon is commonly ascribed to refraction, but erroneously. The cause alone lies in the rays of light reflected from the vapours below, which, in consequence of this reflection, appear so dazzling to the eye, that they conceal the objects situated below, and present the same appearance as the heavens. Professor De Luc says, the presence of the sun is the principal condition of this phænomenon. In several observations made by this gentleman, he found, that the less dense part of the vapour, which did not reflect rays of the sun, but which always grew denser the lower his station became, acted like a veil, which interposed itself between his eye and the trees which had not yet disappeared; thus making him observe the distance, and causing the elevated trees to appear as if floating behind the row to which they belonged. De Luc's curious dissertation on this subject is given in Phil. Mag. No. 46.

Elevation (Angle of), in gunnery, that comprehended between the horizon and the line of direction of a cannon or mortar; or it is that which the chase of a piece, or the axis of its hollow cylinder, makes with the plane of the horizon.

ELEVATOR. *s.* (from *elevate.*) A raiser or lifter up.

Eleva'tor. (*elevator*, from *elevo*, to lift up.) A muscle is so called whose office is to lift up the part to which it is attached. Also a chirurgical instrument with which surgeons raise any depressed portion of bone, but chiefly those of the cranium.

Eleva'tor labii superioris proprius. See **Levator labii superioris alæque nasi.**

Eleva'tor labii inferioris proprius. See **Levator labii inferioris.**

Eleva'tor labiorum communis. See **Levator anguli oris.**

ELEVE, a term purely French, though of late used also in our language. Literally it signifies a disciple or scholar bred up under any one, being formed from the Italian *allievo*, an apprentice or novice. It was first used by the French writers in speaking of painters; such a painter was an eleve of Da Vinci, of Raphael, &c. From painting it came to be applied to such as studied or learned any other art under a master; and afterwards to certain members of the Royal Academy of Sciences, since called adjoints.

ELE'VEN. *a.* (ændleꝼen, Saxon.) Ten and one.

ELE'VENTH. *a.* (from *eleven.*) The next in order to the tenth.

Eleventh, a musical interval, consisting of eleven diatonic sounds. It is the octave of the fourth.

ELEUSINIA, a great festival observed every fourth year by many of the Grecian states, but more particularly by the people of Athens, every fifth year, at Eleusis in Attica, where it was introduced by Eumolpus, B.C. 1356. It was the most celebrated of all the religious ceremonies of Greece, whence it is often called, by way of eminence, μυστηρια, the mysteries. It was so superstitiously observed, that if any one ever revealed it, it was supposed that he had called divine vengeance upon his head, and it was unsafe to live in the same house with him. Such a wretch was publicly put to an ignominious death. This festival was sacred to Ceres and Proserpine, every thing contained a mystery, and Ceres herself was known only by the name of αχθεια, from the sorrow and grief (αχθος) which she suffered for the loss of her daughter. This mysterious secrecy was solemnly observed, and enjoined to all the votaries of the goddess; and if any one ever appeared at the celebration, either intentionally or through ignorance, without proper introduction, he was immediately punished with death. Persons of both sexes and all ages were initiated at this solemnity, and it was looked upon as so heinous a crime to neglect this sacred part of religion, that it was one of the heaviest accusations which contributed to the condemnation of Socrates. For a more minute and detailed description of all the ceremonies exercised in the celebration of this grand festival, the student is referred to Mr. Lampriere's Dictionary, Potter's Antiquities, or De Pauw on the Greeks, vol. ii. p. 147—158.

Some have supposed the principal rites at the Eleusinian festivals to have been obscene and abominable, and that from thence proceeded all the mysterious secrecy. They were carried from Eleusis to Rome in the reign of Adrian, where they were observed with the same ceremonies as before, though perhaps with more freedom and licentiousness. They lasted about 1800 years, and were at last abolished by Theodosius the Great.

ELEUSIS, a town of Attica, equally distant from Megara and the Piræus, celebrated for the festivals of Ceres. See **Eleusinia.**

Eleusis, now called **Lepsina**, once a considerable city of Achaia, the modern Livadia, in European Turkey.

ELEUTHERIA, a festival celebrated at Platæa in honour of Jupiter Eleutherius, or the assertor of liberty, by delegates from almost all the cities of Greece. Its institution originated in this: After the victory obtained by the Grecians under Pausanias over Mardonius the Persian general in the country of Platæa, it was agreed upon in a general assembly, that deputies should be sent every fifth year from the different cities of Greece, to celebrate festivals of liberty. Liberated slaves had, likewise, their Eleutheria. And the Samians had a festival of the same name in honour of the god of love.

Eleuthe'ria bark. See **Cascarillæ cortex.**

Eleuthe'riæ cortex. See **Cascarillæ cortex.**

ELF, a term now almost obsolete, formerly used to denote a fairy or hobgoblin; an imaginary being, the creature of ignorance, superstition, and craft. See **Fairy.**

Elf-arrows, in natural history, a name given to the flints anciently fashioned into arrow-heads, and still found fossile in Scotland, America, and several other parts of the word.

To **Elf.** *v. a.* To entangle hair in so intricate a manner that it is not to be unravelled (*Shakspeare*).

E'LFIN. *a.* (from *elf.*) Relating to fairies; elvish (*Spenser*).

E'LFLOCK. *s.* (*elf* and *lock.*) Knots of hair twisted by elves (*Shakspeare*).

ELGIN, the capital town of the county of Murray, in Scotland. Lat. 57. 37 N. Lon. 3. 15 W.

ELIAS (Matthew), an eminent painter, born at Cassel, in 1658, of poor parentage, and originally employed in attending cattle; but as Corbeen the painter passed the road, he saw the boy drawing a fortification on the ground, which led him to take him under his care and instruction. Elias soon gained the affection and esteem of his master, by evincing superior talents to his fellow-students. At the age of twenty, Corbeen sent him to Paris for further improvements. For some years he continued at Paris, but afterwards he went to Dunkirk, where he painted a grand altar-piece, representing the death of St. Barbe. Some of his portraits are in high estimation, but he failed in the draperies. He died at Dunkirk in 1741.

ELICHRYSUM. In the pharmacopœias. (*elichrysum*, ηλιοχρυσον, from ελιος, the sun, and χρυσος, gold: so called from their shining yellow appearance.) Stæchas citrina. Goldilocks. This small downy plant is the gnaphalium stæchas of Linnéus. The flowers are warm, pungent, and bitter, and said to possess aperient and corroborant virtues.

Elichry'sum. Xeranthemum, Linn. In botany, a genus of the class syngenesia, order polygamia superflua. Receptacle naked; down simple or feathery; calyx imbricate, radicate; with the ray coloured. Twenty-four species: two herbaceous plants of New Zealand; the rest shrubs, or shrubby plants of the Cape.

To ELI'CITE. *v. a.* (*elicio*, Lat.) To strike out; to fetch out by labour or art (*Hale*).

ELI'CIT. *a.* (*elicitus*, Latin.) Brought into act (*Hammond*).

ELICITA'TION. *s.* (from *elicio*, Latin.) Excitement of the power of the will into act (*Bramhall*).

To ELI'DE. *v. a.* (*elido*, Latin.) To break in pieces; to crush (*Hooker*).

ELIGIBI'LITY. *s.* (from *eligible.*) Worthiness to be chosen (*Fiddes*).

E'LIGIBLE. *a.* (*eligibilis*, Latin.) Fit to be chosen; preferable (*Addison*).

E'LIGIBLENESS. *s.* (from *eligible.*) Worthiness to be chosen; preferableness.

ELIMINA'TION. *s.* (*elimino*, Latin.) The act of banishing; rejection.

Elimination, in algebra, the same as extermination.

ELIQUATION, in chemistry, an operation by which a more fusible substance is separated from one that is less so, by means of a heat sufficiently intense to melt the former, but not the latter. Thus an alloy of copper and lead may be separated by a heat capable of melting the latter, but not the former.

ELIS, a country of Peloponnesus at the west of Arcadia, and north of Messenia. It runs along the coast, and is watered by the river Alpheus. The capital of the country is called Elis. It was originally governed by kings, and received its name from Eleus, one of its monarchs. Elis was famous for the horses it produced, whose celerity was so often known and tried at the Olympic games. (*Virg. Strab.* &c.).

ELI'SION. *s.* (*elisio*, Latin.) 1. The act of cutting off (*Swift*). 2. Division; separation of parts (*Bacon*).

Elision, in grammar, the cutting off or suppressing a vowel at the end of a word, for the sake of sound or measure, the next word beginning with a vowel. Elisions are pretty frequently met with in English poetry, but more frequently in the Latin, French, &c. They chiefly consist in suppressions of the *a*, *e*, and *i*; though an elision suppresses any of the other vowels.

ELIXATION, in pharmacy, the extracting the virtues of ingredients by boiling or stewing.

ELIXIR. (*elixir*, from *elekser*, an Arabic word signifying quintessence.) A term formerly applied to many preparations similar to compound tinctures. It is now very little employed.

ELIZABETH, queen of England, was the daughter of Henry VIII. by his second wife Anne Boleyn, and was born in 1533. Her mother at her death recommended her to the particular care of Dr. Parker, afterwards archbishop of Canterbury, who instructed her in the principles of true Christianity. At the accession of Mary she was committed to the Tower, and bishop Gardiner laboured earnestly to have her put to death, but Philip of Spain saved her life, with the prospect of marrying her in case his wife should die. She commenced her reign in 1558, and possessed all the accomplishments of person and mind necessary to render her the favourite of a gallant nation. The exiled protestants hastened home at the news of her accession, and all the friends of the reformation were elated with joy at having a princess who was known to be a favourer of that cause. Elizabeth, however, conducted herself with admirable prudence and moderation, not willing to irritate the ancient nobility too much at once. She even affected a desire to be on good terms with pope Paul IV. but that haughty pontiff treated her in so rude a manner, that she had a good pretence for breaking with the papal see entirely. Before she came to the crown, the king of Sweden made her an offer of marriage, which she declined accepting; and afterwards Philip of Spain made her proposals, which she also refused. Her declaration was to have inscribed on her tombstone, "Here lies a queen, who reigned so long, and lived and died a virgin." This aversion of the queen to matrimony has been a curious subject of investigation to historians. The real reason appears to be this, that she was unwilling to have any restraint upon her Amazonian mind. It is certain she was not constitutionally indifferent; for she was fond of being admired, and prided herself much upon her beauty, and the other accomplishments of her sex. We cannot here enter into the historical particulars of her reign; but must refer to our most celebrated histories of England. She reigned nearly 44½ years, and died April 3d, 1603, aged 70.

Puttenham in his Art of English Poetry, speaking of his contemporary writers, says, "But, last in recital, and first in degree, is the queen, whose learned, delicate, and noble muse, easily surmounteth all the rest, for sense, sweetness, or subtility, be it in ode, elegy, epigram, or any kind of poem." Many specimens of her extemporaneous effusions in Latin and English poetry are preserved: we must content ourselves with mentioning one. Sir Walter Raleigh having written on a window,—

> "Fain would I climb, yet fear I to fall;"

She immediately wrote underneath it,—

> "If thy heart fail thee, climb not at all."

Doubtless Elizabeth was a woman of singular capacity and extraordinary acquirements; and if we could forget the story of the Scottish Mary, and of the unfortunate Essex, together with the burning of some baptists for the crime of worshipping God according to the dictates of their own conscience; could we, in short, forbear to contemplate her character through the medium of morality and religion, we should class her amongst the most illustrious of illustrious women.

The character of this princess is thus given by Smollett: "Elizabeth in her person was masculine, tall, straight, and strong limbed, with an high round forehead, brown eyes, fair complexion, fine white teeth, and yellow hair; she danced with great agility; her voice was strong and shrill; she understood music, and played upon several instruments. She possessed an excellent memory, and understood the dead and living languages, and made good proficiency in the sciences, and was well read in history. Her conversation was sprightly and agreeable, her judgment solid, her apprehension acute, her application indefatigable, and her courage invincible. She was the great bulwark of the protestant religion; she was highly commendable for her general regard to the impartial administration of justice; and even for her rigid economy, which saved the public money, and evinced that love for her people which she so warmly professed. Yet she deviated from justice in some instances when her interest and passions were concerned; and notwithstanding all her great qualities, we cannot deny she was vain, proud, imperious, and in some cases cruel: her predominant passions were jealousy and avarice; though she was also subject to such violent gusts of anger as overwhelmed all regard to the dignity of her station, and even hurried her beyond the common bounds of decency. She was wise and steady in her principles of government, and above all princes fortunate in a ministry."

Elizabeth's Islands, several islands on the coast of Massachuset's Bay, in N. America. Lat. 42. 0 N. Lon. 69. 3 W.

ELK, in mastiology. See Cervus.

ELL, Ulna, a measure of length, different in different countries: but those mostly used in England are the English and Flemish ells; the former of which is three feet nine inches, or one yard and a quarter, and the latter only twenty-seven inches, or three quarters of a yard. In Scotland, the ell contains 37 2-10th English inches.

ELLEBORUM. See Helleborus albus.

ELLESMERE, a town of Shropshire, with a market on Tuesdays. Lat. 52. 53 N. Lon. 2. 52 W. Here are 5553 inhabitants.

ELLIPSE, or Ellipsis, is one of the conic sections, properly called an oval; being called an ellipse or ellipsis by Apollonius, the first and principal author on the conic sections, because in this figure the squares of the ordinates are *less* than, or *defective* of, the rectangles under the parameters and abscisses.

This figure is differently defined, either from some of its properties, from mechanical construction (see Directrix), or from the section of a cone. We here prefer the latter, and therefore say, an ellipse is a plane figure made by cutting a cone by a plane passing obliquely through the opposite sides of it.

There are various methods of describing an ellipse, which are deduced from its different properties; we give the following, as one of the best:

If any two points, as A and B, be taken in any plane, and in them are fixed the extremities of a thread, whose length is greater than the distance between the points, and the thread extended by means of a small pin C, and if the pin be moved round from any point until it return to the place from whence it began to move, the thread being extended during the whole time of the revolution, the figure which the small pin by this revolution describes is an an ellipse.

See also Elliptic compasses.

Most useful properties of the ellipse. 1. The rectangles under the abscisses are proportional to the squares of their ordinates: Or, again, as any diameter is to its parameter, so is the said rectangle under two abscisses of that diameter to the square of the ordinate.

2. The sum of two lines drawn from the foci to meet in any point of the curve, is always equal to the transverse axis; consequently the line drawn from the focus to the end of the conjugate axis, is equal to the semi-transverse.

3. If from any point of the curve there be an ordinate to either axis, and also a tangent meeting the axis produced; then half that axis will be a mean proportional between the distances from the centre to the two points of intersection. And consequently all the tangents meet in the same point of the axis produced, which are drawn from the extremities of the common ordinates of all ellipses described on the same axis.

4. Two lines drawn from the foci to any point of the curve, make equal angles with the tangent at that point.

5. All the parallelograms are equal to each other, that are circumscribed about an ellipsis; and every such parallelogram is equal to the rectangle of the two axes.

6. The sum of the squares of every pair of conjugate diameters, is equal to the same con-

stant quantity, viz. the sum of the squares of the two axes.

7. If a circle be described upon either axis, and from any point in that axis an ordinate be drawn both to the circle and ellipsis; then shall the ordinate of the circle be to the ordinate of the ellipse, as that axis is to the other axis.

And in the same proportion is the area of the circle to the area of the ellipse, or any corresponding segments. Also the area of the ellipse is a mean proportional between the areas of the inscribed and circumscribed circles.

For other properties, with their demonstrations, we refer to the best treatises on conics, particularly Hamilton's, Hutton's, Simpson's, and Robertson's, and to our article Conics.

Some ingenious authors have readily investigated the properties of the ellipse, by considering it as the oblique section of a cylinder. See De L'Hospital's Con. lib. 6. Maclaurin's Fluxions, vol. ii. p. 514, &c.

Ellipsis, in grammar, a figure of syntax, in which one or more words are not expressed: a deficiency from which it has derived the name of ellipsis.

ELLIPSOGRAPH, an instrument with which ellipses are described: elliptic compasses.

ELLIPSOID, a solid generated by the revolution of an ellipse about either axis. See Spheroid.

ELLIPTICAL. Elli'ptic. *a.* (from *ellipsis.*) Having the form of an ellipsis; oval (*Cheyne*).

Elliptic leaf. In botany. Folium ellipticum. Lanceolate, but with the breadth of an ovate leaf. Lanceolatum latitudini ovati folii. Delin. Pl.—In Philos. Bot. it is made synonymous with oval. Both the elliptic and oval leaf are in the form of an ellipse; and the former differs from the latter only in being more oblong; and yet broader than the lanceolate leaf.

Elliptic compasses. See Compasses.

ELLIPTICITY, of the terrestrial spheroid, is the difference between the major and the minor semiaxes; it is generally expressed in terms of the former, that is, of the radius of the equator. The quantity of the ellipticity has been variously assigned by different mathematicians: Sir Isaac Newton, supposing the earth of uniform density, gave $\frac{1}{230}$ for the ellipticity: Boscovich, from a mean of several admeasurements, stated it at $\frac{1}{248}$: La Lande, $\frac{1}{313}$: La Place, $\frac{1}{321}$: Sejour, $\frac{1}{307}$: Carouge, $\frac{1}{300}$: Krafft, $\frac{1}{277}$: and Playfair, from a theorem of Clairault applied to the heterogeneous spheroid, states it at $\frac{1}{304}$. Setting aside those which are deduced from the hypothesis of uniform density, $\frac{1}{320}$ may be admitted as the most probable value of the ellipticity. See Earth.

ELLIPTOIDES, an infinite ellipsis, i. e. an ellipsis defined by the equation $ay^{m+n} = bx^m \times a - x^n$, wherein m 7 1 or n 7 1.

Of this there are several kinds or degrees; as the cubical ellipsoid, wherein $ay^3 = bx^2 \times a - x$. A biquadratic or surdesolidal elliptoid, or that of the third order, wherein $ay^4 = bx^2 \times a \quad x^2$.

ELLISIA. In botany, a genus of the class pentandria, order monogynia. Corol funnelform, narrow; berry dry, two-celled, two-valved; seeds two, dotted, one upon the other. One species only; an annual plant of Virginia with a white flower.

ELM-TREE. See Ulmus.

Cit. Boucher, in a memoir read before la Société d'Emulation at Abbeville, has given some observations on elm-trees. These trees are frequently attacked by ulcers, from which, at length, a great number of them perish. Du Hamel had already endeavoured to find out the cause of this disease, and ascribed it to a plethora of the sap, an opinion which Cit. Boucher has confirmed by numerous experiments. He proposed at the same time a remedy, which he successfully applied to it. He observed that the local ulcer never attacked the trees on the north side, but always on the south side. It acts principally on trees planted in a boggy soil, and along the sides of rivers. Its seat is generally not far from the ground. This ulcer, owing to superabundant sap, differs from a similar one, described in Journal d'Histoire Naturelle, No. 5, 1789, as in this the liquor exposed to the air soon takes the consistency of a gum, and has the flavour of sugar. The remedy consists in boring every tree attacked by the disease at the ulcer itself; and in applying a tube in the hole, occasioned by the borer, penetrating about nine lines in depth. The sound trees, which are also bored, afford no liquor, whereas those that are ulcerated yield it in great abundance, increasing particularly in fine weather, and when the wound is exposed to the south. Stormy weather and great winds stop the infusion. In this manner, he remarks that the ulcers dry and heal in 48 hours. It is probable, that such a terebration, tried on other vegetables, and particularly on fruit trees, will produce the same effects. Pliny, Columella, and Palladius, have already mentioned this expedient being employed by the ancients, which, however, has not been practised for many years. Cit. Boucher concludes by remarking, that this tree is a native of Europe, and has not been lately introduced into France, as is commonly supposed; but the writings of the ancients prove that it existed there long ago. The chemical analysis which he made of the sap, shewed that it contained a considerable quantity of acetite of potash, a little acetite of lime, a certain quantity of vegetable or muco-saccharine matter, and a considerable proportion of muriate of lime; slight traces of sulphate and muriate of potash were likewise perceived.

ELMACINUS (George), an Egyptian author of the 13th century. He wrote a history of the Saracens, from Mohammed to A.D. 1118. Though he was a Christian, he was honourably employed by the Mohammedan princes. On this account he speaks in such high terms of the Musulmans, and even of Mohammed himself, as to have made some persons believe him not to have been a Christian. His history was translated from the Arabic into Latin by Erpenius, and printed in both languages at Leyden in 1625, folio.

ELMINTHES. (*ελμινθες*, from *ειλω*, to involve.) Worms. See HELMINTHES, and HELMINTHICS.

ELOCU'TION. *s.* (*elocutio*, Latin.) 1. The power of fluent speech (*Wotton*). 2. Power of speaking; speech (*Milton*). 3. The power of expression or diction; eloquence; beauty of words (*Dryden*).

ELOCUTION, is defined by Tully, the choosing and adapting of words, and sentences, to the things, or sentiments, to be expressed. To the elocution then properly belongs the *delectus verborum*, or choice of words. That which treats of the several properties and ornaments of language in common is called general elocution, consisting of elegance, composition, and dignity; and particular elocution considers them as they are made use of to form different sorts of style.

Elegance consists in two things, purity and perspicuity: and both these, as well with respect to single words, as their construction in sentences. These properties in language give it the name of elegant, for a like reason that we call other things so which are clean and neat in their kind. But in the common use of our tongue, we are apt to confound elegance with eloquence; and say, a discourse is elegant, when we mean by the expression, that it has all the properties of fine language.

Composition, in the sense it is here used, gives rules for the structure of sentences, with the several members, words and syllables; of which they consist, in such a manner as may best contribute to the force, beauty, and evidence of the whole.

Dignity consists in the right use of tropes and figures. It is not sufficient for an orator to express himself with propriety and clearness, or in smooth and harmonious periods; but his language must likewise be suited to the nature and importance of the subject. And therefore, as elegance gives rules for the first of these, and composition for the second; so does dignity for the last of them. It is very evident, that different subjects require a different style and manner of expression; since, as Quintilian says, "What is magnificent in one discourse would be turgid in another; and those expressions which appear low upon a sublime subject, would suit lesser matters: and as in a florid harangue a mean word is remarkable, and like a blemish; so any thing lofty and bright upon a trivial argument is disproportionate, and like a tumour upon an even surface." Now this variety in the manner of expression arises in a great measure from tropes and figures, which not only enliven and beautify a discourse, but give it likewise force and grandeur; for which reason this part of elocution seems to have been called dignity.

Elocution is sometimes used more restrictedly to denote the just and graceful management of the voice, countenance, and gesture, in speaking; and in this sense it is the same with that which, in common language, is called a good delivery.

ELOGY. (*eloge*, French.) A praise or panegyric bestowed on any person or thing, in consideration of its merit. The beauty of elogy consists in an expressive brevity. Elogiums should not have so much as one epithet properly so called, nor two words synonymous. They should strictly adhere to truth; for extravagant and improbable elogies rather lessen the character of the person or thing they would extol.

ELOHI, ELOI, or ELOHIM, in scripture, one of the names of God. But it is to be observed, that angels, princes, great men, judges, and even false gods, are sometimes called by this name. The sequel of the discourse is what assists us in judging rightly concerning the true meaning of this word. It is the same as Eloha. One is the singular, the other the plural. Nevertheless, Elohim is often construed in the singular number, particularly when the true God is spoken of; but when false gods are spoken of, it is construed rather in the plural.

To E'LOIGNE. *v. a.* (*eloigner*, French.) To put at a distance: not in use (*Donne*).

To ELO'NGATE. *v. a.* (from *longus*, Latin.) 1. To lengthen; to draw out. 2. To put further off (*Brown*).

To ELO'NGATE. *v. n.* To go off to a distance from any thing (*Brown*).

ELONGA'TION. *s.* (from *elongate*.) 1. The act of stretching or lengthening itself (*Arbuthnot*). 2. The state of being stretched. 3. (In medicine.) An imperfect luxation (*Qu.*). 4. Distance; space at which one thing is distant from another (*Glanville*). 5. Departure; removal (*Brown*).

ELONGATION, in astronomy, the distance of a planet from the sun, with respect to the earth; or the angle formed by two lines drawn from the earth, the one to the sun, and the other to the planet; or the arc measuring that angle: Or it is the difference between the sun's place and the geocentric place of the planet.

The *greatest elongation*, is the greatest distance to which the planets recede from the sun, on either side. This is chiefly considered in the inferior planets, Venus and Mercury; the greatest elongation of Venus being about 47½ degrees, and of Mercury only about 27½ degrees; which is the reason that this planet is so rarely seen, being usually lost in the light of the sun.

To ELO'PE. *v. a.* (*loopen*, to run, Dutch.) To run away; to break loose; to escape (*Addison*).

ELO'PEMENT. *s.* (from *elope*.) Departure from just restraint (*Ayliffe*).

ELO'PHORUS. In zoology, a tribe of coleopterous insects of the genus nitidula, thus called in the Fabrician entomology. See NITIDULA.

ELOPS. Scar-fish. In zoology, a genus of the class pisces, order abdominalia. Head smooth; edges of the jaws and palate rough with teeth; gill-membrane thirty-rayed, and armed on the outside in the middle with five teeth. One species only; tail armed above and beneath. Inhabits Carolina; body long; and only differs from the salmon in wanting the fleshy back-fin.

E'LOQUENCE. *s.* (*eloquentia*, Latin.) 1. The power of speaking with fluency and elegance; oratory (*Shakspeare*). 2. Elegant language uttered with fluency (*Pope*).

If eloquence and rhetoric be distinguished, the latter may be considered as proposing and explaining the theory, and the former as the practise of the art; but they are generally used indiscriminately for each other.

Demosthenes and Cicero are the two patterns of ancient eloquence; the one among the Greeks, the other among the Romans. Their manner, however, was exceedingly different; the first being close, strong, nervous, concise, and severe, so that a word could not be spared; the latter copious, florid, and rich, so that a word could not be added.

It was objected to Cicero, that his eloquence was Asiatic, that is, redundant, or stuffed with superfluous words and thoughts.

True eloquence depends principally on the vivacity of the imagination. In strictness, it is not that which gives grace and ornament, but life and motion, to discourse.

The authors of the Art of Thinking remark, that the rules of eloquence are observed in the conversation of people naturally eloquent, though they never think of them while they practise them. They practise those rules because they are eloquent; not in order to be eloquent.

Eloquence, according to the modern ideas of it, appears to be the medium between the impetuosity which oratory admits, and which was highly characteristic of ancient oratory, and the studied artifice of the professed rhetoricians. The term is sometimes applied to composition, sometimes to delivery. When applied to both, it comprehends a certain degree of elegance, both in diction and manner. The want of that energy which approaches to violence is compensated by pertinency of language, fluency of utterance, and guarded chastity of address. In a word, its excellency consists in a pleasing adaptation of language to the subject, and of manner to both. It refuses too close an imitation of the turbid emotions, but it delights in animated description. It seems rather partial to the pathetic. The elegance and graces which it loves, harmonizing most easily and successfully with the softest and finest feelings of our natures.

The power of oratorial eloquence is almost irresistible. It penetrates into the inmost recesses of the soul. It is able to excite or to calm the passions of men at will; to drive the multitude forwards to acts of madness, or to say to the contending passions, "Peace, be still." It changes the whole current of our ideas, concerning the nature and importance of objects; and of our obligations and advantages respecting them; it rouses from pernicious indolence, and renders the sentiments and dispositions already formed most influential. In a word, it has made of the human species both monsters and angels, excited men to deeds of horror, and to the most noble and generous exertions. Since its powers are so varied, fascinating, and extensive, and sometimes so prejudicial, some men have argued for its extinction, or, at least, for its being discountenanced: but we recollect no arguments which they have brought forward, which might not with equal propriety be urged against the use of speech, or against many other of our blessings and advantages: for what blessings have we which may not, in consequence of the freedom and depravity of the human will, be abused? If the beauty, the delicacy and grace of the female form, are sometimes the means of engendering impure desires in the bosoms of men, shall we, therefore, wish for the extermination of women, and argue for the banishment of "God's last and best workmanship" from the face of creation?

ELPHIN, a town of Ireland, in the county of Roscommon, and the see of a bishop. Lat. 53. 46 N. Lon. 8. 30 W.

ELSE. *pronoun.* (elleꞃ, Saxon.) Other; one beside (*Denham*).

Else. *ad.* 1. Otherwise (*Tillotson*). 2. Beside; except that mentioned (*Dryden*).

E'LSEWHERE. *ad.* (*else* and *where*.) 1. In any other place (*Abbot*). 2. In other places; in some other place (*Tillotson*).

ELSHEIMAR (Adam), an eminent painter, born at Frankfort upon the Maine, in 1574. He became excellent in painting landscapes, histories, and night-pieces, but his productions are scarce and valuable. He died in 1610.

ELSHOLTZIA. In botany, a genus of the class didynamia, order gymnospermia. Calyx tubular, five toothed; corol two-lipped, the upper lip four-toothed; lower lip longer than the upper, undivided, slightly crenulate; stamens distant. Two species: one a native of Siberia, the other of the East Indies.

ELSINORE, a town of Zealand, in Denmark, seated at the entrance of the Baltic Sea, where all ships that pass through the Sound pay a toll to the king of Denmark. It is 20 miles N.E. of Copenhagen. Lat. 55. 59 N. Lon. 12. 50 E.

ELTHAM, a town of Kent, having a market on Mondays. It is 8 miles E.S.E. of London, and 3 S. of Woolwich

ELVAS, an episcopal town of Alentejo, in Portugal, defended by a strong castle. Lat. 38. 43 N. Lon. 7. 5 W.

To ELU'CIDATE. *v. a.* (*elucido*, Latin.) To explain; to clear; to make plain (*Boyle*).

ELUCIDA'TION. *s.* (from *elucidate*.) Explanation; exposition (*Boyle*).

ELUCIDA'TOR. *s.* (from *elucidate*.) Explainer; expositor; commentator (*Abbot*).

To ELU'DE. *v. a.* (*eludo*, Latin.) 1. To escape by stratagem; to avoid by artifice (*Rogers*). 2. To mock by an unexpected escape (*Pope*).

ELU'DIBLE. *a.* (from *elude.*) Possible to be defeated (*Swift*).

ELUL, in ancient chronology, the 12th month of the Jewish civil year, and the 6th of the ecclesiastical: it consisted of only 29 days, and answered to part of our August and September.

ELVELA, a genus of plants belonging to the cryptogomia class, and order of fungi. The fungus is turbinated, or like an inverted cone.

ELVELO'CK. *s.* Knot in the hair (*Brown*).

ELVES. The plural of *elf* (*Pope*).

E'LVISH. *a.* (from *elves.*) Relating to elves, or wandering spirits (*Drayton*).

ELU'MBATED. *a.* (*elumbis,* Latin.) Weakened in the loins.

ELU'SION. *s.* (*elusio,* Latin.) An escape from examination; an artifice (*Woodward*)

ELU'SIVE. *a.* (from *elude.*) Practising elusion; using arts to escape (*Pope*).

ELU'SORY. *a.* (from *elude.*) Tending to deceive; fraudulent (*Brown*).

To **ELU'TE.** *v. a.* (*eluo,* Latin.) To wash off (*Arbuthnot*).

To **ELU'TRIATE.** *v. a.* (*elutrio,* Latin.) To decant, or strain out (*Arbuthnot*).

ELUTRIATION. (*verwastchen,* German.) In chemistry, the ablution, or washing a compound substance with water so that the different parts of which it consists may be separated from each other, as consisting of different gravities. For this purpose the mixture is stirred up briskly with water, and when the heavier particles have again fallen to the bottom, the turbid water, containing the lighter ones still suspended, is poured off into another vessel. By this simple method a person accustomed to the business will separate three or four substances from each other with surprising exactness and expedition.

ELWANGEN, a town of Suabia, in Germany, 25 miles S. W. Anspach. Lat. 49. 2 N. Lon. 10. 28 E.

ELY, a town of Cambridgeshire, with a bishop's see, and a market on Saturday. It is seated on the river Ouse (which is navigable hence to Lynn) in the fenny and unwholesome tract called the Isle of Ely. The assizes are held here once a year only. It is a county of itself, including the territory around it, and has a distinct civil and criminal jurisdiction, of which the bishop is the head, in the same manner as the bishop of Durham is of that county. It has a very fine cathedral, but is otherwise a mean place. Lat. 52. 24 N. Lon. 0. 9 E. This see has given two saints and two cardinals to the church of Rome; and to the English nation, 9 lord chancellors, 7 lord treasurers, 1 lord privy seal, 1 chancellor of the exchequer, the chancellor to the university of Oxford, 2 masters of rolls, and 3 almoners.

ELY (Isle of), a fenny district in Cambridgeshire. See CAMBRIDGESHIRE.

ELYMAIS, the capital city of the land of Elam, or the ancient Persia. It was situated upon the Eulæus.

ELYMUS. Lime grass. In botany, a genus of the class triandria, order digynia. Calyx lateral, two-valved, aggregate, many flowered. Twelve species; scattered over the globe, of which three are common to the woods or sandy shores of our own country. See botany, Pl. LXXXIX.

One of the most valuable of the lime-grasses is e. arenarius, upright sea lime-grass, with close erect spike; lanceolate calyx the length of the spikelets; leaves with a spinous point. This grass is truly useful as binding the loose sand together on sea-coasts by means of its long creeping roots. It is frequently found on our own shores.

ELY'SIAN. *a.* (*elysius,* Lat.) Deliciously; soothing; exceedingly delightful (*Milton*).

ELYSIUM, and ELYSII CAMPI, in the ancient mythology, a place or island in the infernal regions, where according to the mythology of the ancients, the souls of the virtuous were placed after death. There happiness is complete, the pleasures are innocent and refined. Bowers for ever green, delightful meadows with pleasant streams, are the most striking objects. The air is wholesome, serene, and temperate; the birds continually warble in the groves, and the inhabitants are blessed with another sun and other stars. The Elysian fields were, according to some, in the fortunate islands on the coast of Africa. Others place them in the island of Leuce; and, according to the authority of Virgil, they were situate in Italy. According to Lucian, they were near the moon; or in the centre of the earth, if we believe Plutarch. (*Virg. Homer,* &c.)

ELYTROCELE. (*elytrocele,* ελυτροκηλη; from ελυτρον, the vagina, and κηλη, a tumour.) A hernia in the vagina.

ELYTROID. (*elytroides,* ελυτροειδης; from ελυτρον, a sheath, and ειδος, form.) The tunica vaginalis is so called by some writers, because it includes the testis like a sheath.

ELZEVIRS, famous printers at Amsterdam and Leyden. There were five of this name, Lewis, Bonaventure, Abraham, Lewis, and Daniel. Lewis began to be known at Leyden in 1595, and was the first who made the distinction between the v consonant and the u vowel. Daniel died in 1680. He published a good catalogue of books printed by his family; it was printed at Amsterdam in 7 vols. 12mo. 1674. Their Virgil, Terence, and Greek Testament, have been reckoned their masterpieces.

'EM. A contraction of *them* (*Hudibras*).

To **EMA'CIATE.** *v. a.* (*emacio,* Lat.) To waste; to deprive of flesh (*Graunt*).

To EMA'CIATE. *v. n.* To lose flesh; to pine; to grow lean (*Brown*).

EMACIA'TION. *s.* (*emaciatus,* Latin.) 1. The act of making lean. 2. The state of one grown lean (*Graunt*).

EMACIATION. (from *emacio,* to make lean.) Decay; innutrition; atrophy; consumption.

EMACULA'TION. *s.* (*emaculo,* Latin.) The act of freeing any thing from spots or foulness.

E'MANANT. *a.* (*emanans,* Latin.) Issuing from something else (*Hale*).

To E'MANATE. *v. n.* (*emano*, Latin.) To issue or flow from sómething else.

EMANA'TION. *s.* (*emanatio*, Latin; from è out of, and *manare*, to flow or stream.) 1. The act of issuing or proceeding from any other substance (*South*). 2. That which issues from another substance; an efflux; effluvium (*Taylor*).

EMA'NATIVE. *a.* (from *emano*, Latin.) Issuing from another.

To EMA'NCIPATE. *v. a.* To set free from servitude.

EMANCIPATION, in the Roman law, was the act of setting a son free from the power and subjection of his father. The word is formed from the Latin *ex*, *of*, and *mancipium*, a slave. Emancipation differs from manumission; as the latter was the act of a master in favour of a slave; the former that of a father in favour of his son.

EMANCIPATION is now used, conformably to its etymology, for the act of setting free in general, or deliverance from slavery.

EMARGINATE. (*emarginatum.*) In botany. Notched at the end. End-nicked. Applied to the leaf: to the corol in agrostemma coronaria, &c.; and to the stigma: in the class didynamia.

To EMA'RGINATE. *v. a.* (*margo*, Lat.) To take away the margin or edge of any thing.

To EMA'SCULATE. *v. a.* (*emasculo*, Lat.) 1. To castrate; to deprive of virility (*Graunt*). 2. To effeminate; to vitiate by unmanly softness (*Collier*).

EMASCULATION. *s.* (from *emasculate.*) 1. Castration. 2. Effeminacy; womanish qualities.

To EMBA'LE. *v. a.* (*emballer*, French.) 1. To make up into a bundle. 2. To bind up; to enclose (*Spenser*).

To EMBA'LM. *v. a.* (*embaumer*, French.) To impregnate a body with aromaticks, that it may resist putrefaction (*Donne*).

EMBA'LMER. *s.* (from *embalm.*) One that practises the art of embalming (*Bacon*).

EMBALMING (Art of). The object of this art is, by means of antiseptics, and a peculiar mode of preparation, to prevent the putrefaction of an animal body, so that it may be preserved for a long period of time. Under some form or other this art has been practised from the earliest ages of the world, but chiefly in oriental countries. The honour of its invention has been uniformly ascribed to the Egyptians; and the short account communicated to us, in the Mosaic writings, of the embalming the body of the patriarch Jacob, sufficiently confirms the common opinion.

According to Diodorus Siculus, the ancient Egyptians were accustomed equally to embalm human bodies and the bodies of those animals their superstitions had rendered holy, thus preserving them from spontaneous decomposition, under the name of *mummies*, which is an Arabic, and was probably an Egyptian term. From this writer, as well as from Herodotus, we learn that the Egyptians had several methods of embalming the human body, three of which have descended to us; and to this difference in the process, Leonhardi attributes the different opinions physicians and chemists have had of this ancient operation. 1. A hole was made through the nostrils into the cranium, the brain extracted, and the brain was filled with the embalming substance. The thorax and abdomen were then deprived of their viscera, except the heart and kidneys; they were washed with Phœnician wine, and filled with sweet scented resins and aromatics; the opened parts having been afterwards sewed up, the body was well washed and cleansed, and placed in natron, which is supposed to have been the mineral alkali united with common salt, and found native in Egypt. In this alkali it remained about 30 days; it was taken out and washed a second time, besmeared over with a gum or resin, carefully enveloped with cotton bandages, and placed in a coffin. This method was very expensive, but is the only one that merits the name of embalming.

2. A cheaper way of preserving the body was to introduce various resins, particularly that from the cedar, by the anus, without opening either the belly or thorax; the body was then dried in natron, and afterwards the resin with the corroded intestines were taken away.

3. The cheapest method consisted merely in washing the body, and its exposure to the action of natron, which we are informed destroyed the flesh and only left the skin and bones.

With respect to the embalming substance employed on these occasions there are various opinions. Some, as Rouelle and Vandermonde, look upon it to have been asphaltum mixed with the oil of the cedar seed; whilst Hardley thinks, with the ancients, it was the resin of this tree, or some other vegetable resin. Belloni and Blumenbach are of opinion that asphaltum was used in common operations as being the cheapest, and that, on particular occasions, the odoriferous vegetable resins were chosen; and the latter chemist, on the examination of ten different mummies, found no asphaltum, but very evident traces of vegetable resins. It is, however, certain that the substances for this purpose were not always of the same kind.

The art of embalming the human body has likewise been attempted by some of the moderns, but the mere action of saline bodies, and filling the cavities of the body with aromatic herbs, were found not to be sufficient to preserve it from putrefaction. The best and perhaps the only method worth attention is that pointed out by Dr. Hunter. As soon as the corps is become cold and stiff, and before any symptoms of putrefaction appear, it is to be well washed with warm water; one of the large arteries is then to be laid open, and the fellowing injection to be forcibly made to enter the smallest vessels, even those of the cellular membrane. Two parts of the oil of chamomile are to be mixed with eight parts of oil of lavender, and sixteen of oil of rosemary; likewise the oil of turpentine may be either used alone or mixed with a little of the oils of rosemary and lavender; or, to give it a colour, a little cinnabar may be united with the oil of turpentine. The different viscera are in a short time after to be extracted, the intestines to be carefully cleansed of their contents, and the rest of the viscera to be deprived of their moisture by wiping them repeatedly with dry towels; the body is likewise internally to be cleansed of its blood and injected oils, by squeezing the vessels; the arteries are then to be injected as well as the other large vessels that have been cut, with a mixture composed of six pounds of oil of turpentine, five ounces of turpentine, eleven ounces of cinnabar, two ounces of camphor, and three pounds of strong spirit of wine; with this likewise the fleshy parts that have been well deprived of any moisture are to be carefully anointed, the vessels of the intestines to be injected, and then to be replaced in their former situation, scattering a sufficient quantity of a powder about them, composed of ten pounds of yellow resin or pitch, six pounds of saltpetre, and five ounces of pulverized camphor, so that every vacancy may be perfectly replete with it. Afterwards, when a little of the injecting liquor above mentioned has been poured into the thorax and belly, the skin is to be closed, the mouth, pharynx, and larynx syringed and filled with the powder, together with the cavities of the ears, nose, anus, parts of generation, eyes and eyelids, and the whole body, after having been previously washed and rubbed dry, is to be well rubbed with alcohol and camphor, and finally with the oils of rosemary and lavender. The body being thus embalmed, in order to deprive it of any remaining moisture, it is to be laid in a coffin upon some calcined and finely pulverized gypsum, so as to be on all sides about half covered with it; pieces of camphor are to be strewed about, and a range of open bottles filled with volatile oils; the coffin is then to be well closed, having a lid with a glass in it. In about four years the gypsum should be renewed, and when the body is perfectly dry, it may be dispensed with altogether.

To EMBA'R. *v. a.* (from *bar.*) 1. To shut; to enclose (*Fairfax*). 2. To stop; to hinder by prohibition (*Donne*).

EMBARCADERO, in commerce, a Spanish term, signifying a place which serves some other considerable place farther within land for a port: thus Calao is the embarcadero of Lima.

EMBARCATION. *s.* (from *embark.*) 1. The act of putting on shipboard (*Clarendon*). 2. The act of going on shipboard.

EMBARGO, in commerce, an arrest on ships or merchandise, by public authority; or a prohibition of state commonly on foreign ships, in time of war, to prevent their going out of port, sometimes to prevent their coming in, and sometimes both for a limited time.

To EMBA'RK. *v. a.* (*embarquer*, French.) 1. To put on shipboard (*Clarendon*). 2. To engage another in any affair.

To EMBA'RK. *v. n.* 1. To go on shipboard (*Philips*). 2. To engage in any affair.

To EMBA'RRASS. *v. a.* (*embarrasser*, French.) To perplex; to distress; to entangle (*Spectator*).

EMBA'RRASSMENT. *s.* (from *embarrass.*) Perplexity; entanglement (*Watts*).

To EMBA'SE. *v. a.* (from *base.*) 1. To vitiate; to depauperate; to lower; to deprave; to impair (*Wotton*). 2. To degrade; to vilify (*Spenser*).

EMBA'SSADOR. *s.* (*embaxador*, Spanish.) One sent on a public message. See AMBASSADOR.

EMBASSADRESS. See AMBASSADRESS.

E'MBASSAGE. E'MBASSY. *s.* 1. A public message (*Dryden*). 2. Any solemn message (*Taylor*). 3. An errand, in an ironical sense (*Sidney*).

To EMBA'TTLE. *v. a.* (from *battle.*) To range in order or array of battle (*Prior*).

To EMBA'Y. *v. a.* (from *baigner*, French.) 1. To bathe; to wet; to wash (*Spenser*). 2. (from *bay.*) To enclose in a bay; to landlock (*Shakspeare*).

EMBDEN, a strong town of Westphalia, capital of E. Friesland, with a good harbour. It is divided into three parts, the Old Town, the Faldren, and the two Suburbs. Lat. 53. 26 N. Lon. 7. 25 E. This is the ancient Amisia.

To EMBE'LLISH. *v. a.* (*embellir*, French.) To adorn; to beautify (*Locke*).

EMBE'LLISHMENT. *s.* (from *embellish.*) Ornament; adventitious beauty; decoration; adscititious grace (*Addison*).

E'MBERING. *s.* The ember days (*Tusser*).

E'MBERS. *s.* without a singular (æmyjria, Saxon.) Hot cinders; ashes not yet extinguished (*Bacon*).

EMBER WEEKS, OR DAYS, in the established churches, certain seasons originally set apart, for imploring God's blessing, by prayer and fasting, upon the ordinations performed at such times. These ordination fasts are observed four times in the year; namely, the Wednesday, Friday, and Saturday, after Quadragesima Sunday, after Whitsunday, after Holy-rood day in September, and after St. Lucia's day in December: which four times answer well enough to the four quarters of the year, spring, summer, autumn, and winter. Skinner supposes the word *ember* taken from the ashes, *embers*, then strewed on the head. These ember-weeks are now chiefly taken notice of, on account of the ordination of priests and deacons; because the canon appoints the Sundays next succeeding the ember-weeks for the solemn times of ordination: though the bishops, if they please, may ordain on any Sunday or holiday.

EMBERIZA. Bunting. In zoology, a genus of the class aves, order passeres. Bill conic; mandibles receding from each other from the base downwards; the lower with the sides narrowed in, the upper with a hard knob within. Seventy-seven species: scattered over the four quarters of the globe; but chiefly found in Europe and America; six inhabitants of our own country. The following are the chief:

1. E. nivalis. Snow-bunting. Snow-bird. Quill-feathers white; the primaries black on the outer edge; tail-feathers black, the three lateral ones white. There are three other varieties, from a trifling variation in the colours. Yet in all of them the colours vary with age, sex, or climate; most of them being, however, nearly white in the winter, but the back and middle coverts black. Inhabits during summer in vast flocks the north of Europe, Asia, and America; in winter migrates to a warmer climate; appears in England before the setting in of frost and snow: builds in holes of rocks, and lays five white eggs spotted with brown.

2. E. hortulana. Ortolan. Quill-feathers brown, the first three whitish at the edges; tail-feathers brown, the two lateral ones black on the outer side. Three or four other varieties from a variation or different disposition of the colours. The bill is naked; eyelids and legs yellowish; head and neck olive ash; chin yellowish, surrounded with a cinereous line; feathers of the back and scapulars brownish bay, black in the middle; body beneath reddish. Female; head and neck cinereous, each feather with a narrow blackish line. Inhabits Europe; six and a quarter inches long; feeds chiefly on panic-grass, and grows prodigiously fat, when it is esteemed a delicacy, and was so regarded by the Greeks and Romans; lays twice a year four or five grey eggs in a low hedge or on the ground.

3. E. citrinella. Yellow-hammer. Tail-feathers blackish, the two outer ones on the inner edge with a pointed white spot. Bill black; crown, cheeks and body beneath yellow; eye-brows brownish; nape greenish; feathers of the neck and back blackish down the middle, rufous at the sides and edged with grey: two middle-tailed feathers edged with grey; lateral ones olive without, the tip edged with white; legs yellowish brown. Inhabits Europe; six and a quarter inches long; enters into houses in winter; builds on the ground in meadows; eggs whitish purple with irregular blackish spots and streaks.

4. E. miliaria. Common-bunting. Brown; spotted beneath with black; orbits rufous: bill and legs brownish; quill-feathers dusky, the outer-edges pale-yellow; tail a little-forked, edged with white; legs yellowish. Inhabits in flocks most parts of Europe during the autumn and winter: size of the yellow-hammer; makes its nest in the grass.

5. E. orizivora. Rice-bunting. Black; crown reddish; belly black; tail-feathers daggered. Another variety; colour olive-brown, yellowish beneath; yellow rump, greater wing-coverts and quill-feathers black, edged with white. Inhabits Cuba, and migrates to Carolina as the rice crops advance, committing great ravages; whence its name. It afterwards travels to New York to feed on the young Indian corn; sings well, and is six and three-quarter inches long.

6. E. schoeniclus. Reed-bunting. Head black; body grey and black; outermost tail-feathers with a white wedged spot. There are two other varieties; one brown, cinereous beneath; the other white, with dusky wings. Inhabits Europe and Southern Siberia; the second variety, the Cape; the third, Astrachan; in marshy and reedy places; suspends its nest on four reeds like a hammock, whence its specific name; builds it three feet above the water; lays four or five blueish white eggs with irregular purplish veins; sings in the night, and is much admired for its song; five and three quarters inches long.

To EMBE'ZZLE. *v. a.* (from *imbecile.*) 1. To appropriate by breach of trust (*Hayward*). 2. To waste; to swallow up in riot (*Dryden*).

EMBE'ZZLEMENT. *s.* (from *embezzle.*) 1. The act of appropriating to himself that which is received in trust for another. 2. The thing ill appropriated.

To EMBLA'ZE. *v. a.* (*blasonner*, French.) 1. To adorn with glittering embellishments (*Pope*). 2. To blazon; to paint with ensigns armorial (*Milton*).

To EMBLA'ZON. *v. a.* (*blasonner*, Fr.) 1. To adorn with figures of heraldry. 2. To deck in glaring colours (*Hakewill*).

EMBLA'ZONRY. *s.* (from *emblazon.*) Pictures upon shields (*Milton*).

E'MBLEM. *s.* (ἐμϐλημα.) 1. Inlay; enamel. 2. An occult representation; an allusive picture; a typical designation (*Addison*).

According to lord Bacon, emblems are of use in the art of memory, as sensible objects strike the mind stronger than what is intellectual. Thus it is easier to retain the image of a sportsman hunting a hare, of an apothecary ranging his boxes, an orator making a speech, a boy repeating verses, or a player acting his part; than the corresponding notions of invention, disposition, elocution, memory, and action.

EMBLEMA'TICAL. EMBLEMA'TICK. *a.* (from *emblem.*) 1. Comprising an emblem; allusive; occultly representative (*Prior*). 2. Dealing in emblems; using emblems.

EMBLEMA'TICALLY. *ad.* In the manner of emblems; using emblems (*Swift*).

EMBLE'MATIST. *s.* (from *emblem.*) A writer or inventor of emblems (*Brown*).

EMBOLISMUS. (Εμϐολισμος.) In chronology, signifies intercalation. The word is formed of ἐμϐαλλειν, to insert. As the Greeks made use of the lunar year, which is only 354 days, in order to bring it to the solar, which is 365 days, they had every two or three years an embolism, i. e. they added a 13th lunar month every two or three years, which additional month they called *embolimæus*, ἐμϐολιμαιος, because inserted, or intercalated.

E'MBOLUS. *s.* (ἐμϐολος.) Any thing inserted and acted in another, as the sucker in a pump (*Arbuthnot*).

EMBOLY, a town of Macedonia, with a Greek archbishop's see. It is the ancient Amphipolis, and is sometimes called Christopolis. Lat. 40. 59 N. Lon. 23. 55 E.

To EMBO'SS. *v. a.* (from *bosse*, French.) 1. To form with protuberances (*Milton*). 2. To engrave with relief, or rising work (*Dryden*). 3. (from *emboister*, French.) To enclose; to include; to cover (*Spenser*). 4. (*emboscare*, Italian.) To enclose in a thicket (*Milton*). 5. To hunt hard (*Shakspeare*).

EMBO'SSMENT. *s.* (from *emboss.*) 1. Any thing standing out from the rest; jut; eminence (*Bacon*). 2. Relief; rising work (*Addison*).

EMBOTHRIUM, in botany, a genus of the class tetrandria, order monogynia. Calyxless; petals four, bearing the stamens on the border; follicle round, one-celled, many-seeded; seeds winged. Eight species; elegant shrubs of New Holland or South America, with white or red flowers, in some species raceemed, in others umbelled.

To EMBO'TTLE. *v. a.* (*bouteille*, French.) To include in bottles; to bottle (*Philips*).

EMBOUCHURE, a French word, properly signifying the mouth or entrance of a river. It is sometimes used to denote the mouth of a cannon or of a furnace; but more frequently, in music, for the mouth-piece of a flute, flageolet, clarinet, &c.

To EMBO'WEL. *v. a.* (from *bowel.*) To eviscerate; to deprive of the entrails (*Milton*).

To EMBRA'CE. *v. a.* (*embrasser*, French.) 1. To hold fondly in the arms; to squeeze in kindness (*Dryden*). 2. To seize ardently or eagerly; to lay hold on; to welcome (*Tillotson*). 3. To comprehend; to take in: as, *natural philosophy* embraces *many sciences*. 4. To comprise; to enclose; to contain; to encircle (*Denham*). 5. To admit; to receive (*Locke*). 6. To find; to take (*Shakspeare*). 7. To squeeze in a hostile manner.

To Embra'ce. *v. n.* To join in an embrace (*Shakspeare*).

To Embrace the volt, in the manage, is used when a horse, in working upon volts, makes a good way every time with his fore-legs. The opposite term to embracing a volt is to beat the dust, which is putting his fore-feet near the place from whence he lifted them up. *Embracing the ground* is used in the same sense as embracing the volt. A horse cannot take in too much ground, provided his croup does not throw out, that is, does not go out of the volt.

Embra'ce. *s.* (from the verb.) 1. Clasp; fond pressure in the arms; hug (*Denham*). 2. A hostile squeeze; crush.

EMBRA'CEMENT. *s.* (from *embrace.*) 1. Clasp in the arms; hug; embrace (*Sidney*). 2. Hostile hug; grabble (*Sidney*) 3. Comprehension (*Davies*). 4. State of being contained; enclosure (*Bacon*). 5. Conjugal endearment (*Shakspeare*).

EMBRA'CER. *s.* (from *embrace.*) The person embracing (*Howel*).

EMBRASURE, in architecture, an enlargement of the gap or aperture of a door, or window, within-side the wall.

EMBRASURES, in fortification, are the holes or apertures through which the cannons are pointed; whether in casemates, in batteries, or in the parapets of walls. See Cannon, Ordnance, Battery, &c.

The embrasures are generally about fifteen feet apart, from six to nine or ten feet wide without, and from two to three within. Their height from the platform is usually three feet on the inside, and a foot and half on the outside; that so the muzzle, on occasion, may be sunk, and the piece brought to shoot low.

The best embrasures are those made with a neck, whereby a part of the opening becomes more contracted, and consequently is better adapted to preserve the gunners and cannon from the enemy's shot, than when the cheeks of the embrasures are made strait.

To EMBRA'VE. *v. a.* (from *brave.*) To decorate; to embellish.

To E'MBROCATE. *v. a.* (εμβρεχω, Greek.) To rub any diseased part with medicinal liquids.

EMBROCATION. (*embrocatio*, from εμβρεχω, to moisten or soak in.) A fluid application to rub any part of the body with.

To EMBROI'DER. *v. a.* (*broder*, French.) To border with ornament; to decorate with figured work (*Waller*).

EMBROI'DERER. *s.* (from *embroider.*) One that adorns clothes with needlework (*Ecc.*).

EMBROIDERY, a work in gold, or silver, or silk thread, wrought by the needle upon cloth, stuffs, or muslin, into various figures. In embroidering stuffs, the work is performed in a kind of loom; because the more the piece is stretched, the easier it is worked. As to muslin, they spread it upon a pattern ready designed; and sometimes, before it is stretched upon the pattern, it is starched, to make it more easy to handle. Embroidery on the loom is less tedious than the other, in which, while they work flowers, all the threads of the muslin, both lengthwise and breadthwise, must be continually counted; but, on the other hand, this last is much richer in point, and susceptible of greater variety. Cloths too much milled are scarcely susceptible of this ornament, and in effect we seldom see them embroidered. The thinnest muslins are chosen for this purpose; and they are embroidered to the greatest perfection in Saxony: in other parts of Europe, however, they embroider very prettily, and especially in France.

There are several kinds of embroidery: as, 1. Embroidery on the stamp; where the figures are raised and rounded, having cotton or parchment put under them to support them. 2. Low embroidery; where the gold and silver lie low upon the sketch, and are stitched with silk of the same colour. 3. Guimped embroidery: this is performed either in gold or silver; they first make a sketch upon the cloth, then put on cut vellum, and afterwards sew on the gold and silver with silk thread; in this kind of embroidery they often put gold and silver cord, tinsel, and spangles. 4. Embroidery on both sides; that which appears on both sides of the stuff. 5. Plain embroidery; where the figures are flat and even, without cord, spangles, or other ornaments.

By stat. 22 Geo. II. c. 36. no foreign embroidery, or gold and silver brocade, shall be imported upon pain of being forfeited and burnt, and penalty of 100*l.* for each piece. No person shall sell, or expose to sale, any foreign embroidery, gold or silver thread, lace, fringe, brocade, or make up the same into any garment, on pain of having it forfeited and burnt, and penalty of 100*l.* All such embroidery, &c. may be seized and burnt; and the mercer, &c. in whose custody it was found, shall forfeit 100*l.*

To EMBRO'IL. *v. a.* (*brouiller*, French.) 1. To disturb; to confuse; to distract (*King Charles*). 2. To perplex; to entangle (*Add.*).

To EMBRO'THEL. *v. a.* (*brothel, brodel.*) To enclose in a brothel (*Donne*).

EMBRUN, an ancient and strong city of France, in the department of the Upper Alps, and late province of Dauphiny. It is seated near the river Durance, on a high craggy rock. Lat. 44. 34 N. Lon. 6. 34 E.

EMBRYO. (*embryo*, εμβρυων; from εμβρυω, to bud forth.) The fetus in utero is so called before the fifth month of pregnancy, because its growth resembles that of the budding of a plant.

EMBRYO, is used figuratively, to denote the state of any thing yet unfinished.

EMBRYOTOMY. (*embryotomia*, εμβρυοτομια, from εμβρυον, a fetus, and τεμνω, to cut.) The separating of any part of the fetus whilst *in utero*, to extract it.

EME. *s.* (eame, Saxon.) Uncle: obsolete (*Spenser*).

EME'NDABLE. *a.* (*emendo*, Latin.) Capable of emendation; corrigible.

EMENDA'TION. *s.* (*emendo*, Latin.) 1. Correction; alteration of any thing from worse to better (*Grew*). 2. An alteration made in the text by verbal criticism.

EMENDA'TOR. *s.* (*emendo*, Latin.) A corrector; an improver; an alterer for the better.

EMERALD. See GEMMA.

To EME'RGE. *v. n.* (*emergo*, Latin.) 1. To rise out of any thing in which it is covered (*Boyle*). 2. To issue, to proceed (*Newton*). 3. To rise; to mount from a state of depression or obscurity; to rise into view (*Pope*).

EME'RGENCE. EME'RGENCY. *s.* (from *emerge.*) 1. The act of rising out of any fluid by which it is covered (*Brown*). 2. The act of rising into view (*Newton*). 3. Any sudden occasion; unexpected casualty (*Glanville*). 4. Pressing necessity; exigence. A sense not proper (*Addison*).

EME'RGENT. *a.* (from *emerge.*) 1. Rising out of that which overwhelms or obscures it (*Ben Jonson*). 2. Rising into view, or notice (*Milton*). 3. Issuing from any thing (*South*). 4. Sudden; unexpectedly casual (*Clarendon*).

E'MERODS. E'MEROIDS. *s.* (*hemorrhoids*) Painful swellings of the hemorrhoidal veins; piles (*Samuel*).

EMERSION, in astronomy, is the re-appearance of the sun, moon, or a planet, after having been eclipsed by the interposition of the moon, earth, or other body.

EMERSION is also used when a star, after being hid by the sun, begins to reappear, and to get out of his rays.

EMERSION (Minutes or Scruples of), an arc of the moon's orbit, which her centre passes over, from the time she begins to emerge out of the earth's shadow, to the end of the eclipse.

EMERSON (William), an English mathematician, born in 1701, at Hurworth in the county of Durham. He kept a school for some time, but afterwards left it off, contented with a small paternal estate of about 70*l.* a year. He was a general scholar, and a profound mathematician; but a man of singular and uncouth character and habits. He had but one coat, which he always wore open before, except the lower button; no waistcoat; his shirt quite different from those commonly used, having no opening before, and being buttoned close at the collar behind; a sort of flaxen wig, without a crooked hair in it. One hat lasted him nearly the whole of his life. He always walked to London when he had any thing to publish, and carefully revised every sheet himself. He was wont to study hard for a considerable time, and then would betake himself to the alehouse, to get some person to drink with and to talk to. The duke of Manchester was extremely fond of his conversation, and used frequently to visit him. Sometimes he would ask him to go into his coach, but Emerson always answered, in his rough manner, "D——n your whim-wham, I had rather walk." This ingenious, but eccentric and profane man, died in 1782, at his native village.

The following is a list of Mr. Emerson's works; all of them printed in 8vo., excepting his Mechanics and his Increments in 4to. and his Navigation in 12mo. 1. The Doctrine of Fluxions. 2. The Projection of the Sphere, orthographic, stereographic, and gnomonical. 3. The Elements of Trigonometry. 4. The Principles of Mechanics. 5. A Treatise of Navigation on the Sea. 6. A Treatise on Arithmetic. 7. A Treatise on Geometry. 8. A Treatise of Algebra, in 2 books. 9. The Method of Increments. 10. Arithmetic of Infinites, and the Conic Sections, with other Curve Lines. 11. Elements of Optics and Perspective. 12. Astronomy. 13. Mechanics, with Centripetal and Centrifugal Forces. 14. Mathematical Principles of Geography, Navigation and Dialling. 15. Commentary on the Principia, with the Defence of Newton. 16. Tracts. 17. Miscellanies.

Dr. Horsley very ably and justly characterises the works of Mr. Emerson, when he says they are "composed with great depth of knowledge, with great brevity, and upon sound principles; but without elegance, without order, and without perspicuity." (*Tracts*, p. 356.)

EMERY, in natural history. See SMIRIS.

EMESIA. (εμεσια; from εμεω, to vomit.) In medicine, the act of vomiting.

EMETICAL. EME'TIC. *a.* (εμεω.) Having the quality of provoking vomits (*Hale*).

EME'TICALLY. *ad.* (from *emetical.*) In such a manner as to provoke to vomit (*Boyle*).

EMETICS. (*emetica, medicamenta*, εμετικα; from εμεω, to vomit.) Under this name are to be considered those medicines which, taken into the stomach in a sound state, are capable of exciting vomiting. The entire class may be divided into four orders: 1. Irritating emetics, as antimonium tartarisatum, vitriolum album, and hydrargyrus vitriolatus, which are to be selected for the vigorous in constitution, the melancholic, and those who are with difficulty affected by emetics. 2. Evacuating emetics, as ipecacuanha, asarum, and scilla, adapted to any habit, but to be preferred for the plethoric and infirm. 3. Calefacient emetics, as mustard and horseradish, which are principally to be recommended for the delicate and debilitated. 4. Narcotic emetics, as nicotiana and tabacum, admissible only in those constitutions where there is no degree of irritability in the nervous system.

EMEU, in ornithology. See STRUTHIO.

EMICA'TION. *s.* (*emicatio*, Latin.) Sparkling; flying off in small particles (*Brown*).

EMI'CTION. *s.* (from *emictum*, Latin.) Urine; what is voided by the urinary passages (*Harvey*).

To E'MIGRATE. *v. n.* (*emigro*, Latin.) To remove from one place to another.

EMIGRA'TION. *s.* (from *emigrate.*) Change of habitation (*Hale*).

EMIMS, ancient inhabitants of the land of Canaan beyond Jordan, who were defeated by Chedorlaomer and his allies, Gen. xiv. 5. Moses tells us that they were beaten in Shaveh Kirjathaim, which was in the country of Sihon conquered from the Moabites, Josh. xiii. 19—21. The Emims were a warlike people, of a gigantic stature, great and numerous, and tall as the Anakims.

E'MINENCE. E'MINENCY. *s.* (*eminentia*, Latin.) 1. Loftiness; height. 2. Summit; highest part (*Ray*). 3 A part rising above the rest (*Dryden*). 4. A place where one is exposed to general notice (*Addison*). 5. Exaltation; conspicuousness; reputation; celebrity; fame; greatness (*Stillingfleet*). 6. Supreme degree (*Milton*). 7. Notice; distinction (*Shakspeare*). 8. A title given to cardinals, and to the grand master of Malta.

E'MINENT. *a.* (*eminens*, Latin.) 1. High; lofty (*Milton*). 2. Dignified; exalted (*Dryden*). 3. Conspicuous; remarkable (*Addison*).

EMINENTIÆ QUADRIGEMINÆ. See TUVERCULA QUADRIGEMINA.

EMINENTIAL EQUATION, a term used by some algebraists in the investigation of the areas of curvilineal figures, for a kind of assumed equation that contains another equation eminently, the latter being a particular case of the former.

E'MINENTLY. *ad.* (from *eminent.*) 1. Conspicuously; in a manner that attracts observation (*Milton*). 2. In a high degree (*Swift*).

EMIR, a title of dignity among the Turks, signifying a prince. The vizirs, bashaws, or governors of provinces are called by this name.

E'MISSARY. *s.* (*emissarius*, Latin.) 1. One sent out on private messages; a spy; a secret agent (*Swift*). 2. One that emits or sends out (*Arbuthnot*).

EMI'SSION. *s.* (*emissio*, Latin.) The act of sending out; vent (*Evelyn*).

To EMI'T. *v. a.* (*emitto*, Latin.) 1. To send forth; to let go (*Woodward*). 2. To let fly; to dart (*Prior*). 3. To issue out juridically (*Ayliffe*).

EMMANUEL, or IMMANUEL, (עמנואל, *nobiscum deus.*) A Hebrew word which signifies, *God with us.* Isaiah, viii. 14., in that celebrated prophecy, wherein he declares to Ahaz the birth of the Messiah, who was to be born of a virgin, says, "This child shall be called, and really be Emmanuel, (that is,) God with us." The same prophet, viii. 8. repeats the same thing, while he is speaking of the enemy's army, which, like a torrent, was to overflow Judea. "The stretching out of his wings shall fill the breadth of thy land, O Emmanuel." The evangelist Matthew, i. 23. informs us, that the prophesy was accomplished in the birth of Christ, born of the virgin Mary, in whom the two natures divine and human were united, and so in this sense he was really Emmanuel, or God with us.

EMMELIA, in antiquity, a solemn and majestic dance peculiar to tragedy. None besides emmelia and the military dances had the approbation of Plato.

EMMENAGOGUES. (*emmenagoga, medicamenta*, εμμηναγωγα; from εμμηνια, the menses, and αγω, to move.) Those medicines that possess a power of promoting that monthly discharge of a sanguineous nature though not actually blood, nor, when healthy, coagulating like blood, by the uterus, which, from a law of the animal œconomy, should take place in certain conditions of the female system. The articles belonging to this class may be referred to four orders: 1. Stimulating emmenagogues, as hydrargyrus and antimonial preparations, which are principally adapted for the young, and those with peculiar insensibility of the uterus. 2. Irritating emmenagogues, as aloes, savine, and Spanish flies: these are to be preferred in torpid and chlorotic habits. 3. Tonic emmenagogues, as ferruginous preparations, cold bath, and exercise, which are advantageously selected for the lax and phlegmatic. 4. Antispasmodic emmenagogues, as assafœtida, castor, and pediluvia: the constitutions to which these are more especially suited are the delicate, the weak, and the irritable.

EMMENIA. (from εν, in, and μην, a mouth.) Menorrhœa; catamenia; menstruation.

EMMERICK, a large city of Germany, in the duchy of Cleves. Lat. 51. 45 N. Lon. 6. 4 E.

E'MMET. *s.* (æmette, Saxon.) An ant; a pismire (*Sidney*). See FORMICA.

To EMME'W. *v. a.* (from *mew.*) To mew or coop up (*Shakspeare*).

To EMMO'VE. *v. a.* (*emmouvoir*, French.) To excite; to rouse: not used (*Spenser*).

EMO'LLIENT. *a.* (*emolliens*, Lat.) Softening; supplying (*Arbuthnot*).

EMOLLIENTS. (*emollientia, medicamenta*; from *emollio*, to soften.) Those substances which possess a power of relaxing the living animal fibre, without producing that effect from any mechanical action. The different articles belonging to this class of medicines may be comprehended under the following orders: 1. Humectant emollients, as warm water and tepid vapours, which are fitted for the robust, and those in the prime of life. 2. Relaxing emollients, as althæa, malva, &c. These may be employed in all constitutions, while, at the same time, they do not claim a preference to others from any particular habit of body. 3. Lubricating emollients, as bland oils, fat, and lard. The same observation will hold of this order as was made of the last mentioned. 4. Atonic emollients, as opium and pediluvia: these are applicable to any constitution, but are to be preferred in habits where the effects of this class are required over the system in general.

EMOLLI'TION. *s.* (*emollitio*, Lat.) The act of softening (*Bacon*).

EMO'LUMENT. *s.* (*emolumentum*, Lat.) Profit; advantage (*South*).

EMO'NGST. *prep.* Among (*Spenser*).

EMO'TION. *s.* A violent struggle or disturbance in the mind; a strong and vehement sensation, excited either by a pleasing or a painful object.

Thus is emotion commonly defined: but we apprehend our readers will be more pleased with a philosophical description of the term; which we shall, therefore, give in the judicious language of Dr. Cogan. The state of absolute passiveness (says this philosopher), in consequence of any sudden percussion of mind, is of short duration. The strong impression, or vivid sensation, immediately produces a re-action, correspondent to its nature; either to appropriate and enjoy, or to avoid and repel the exciting cause. This re-action is very properly distinguished by the term *emotion.* The sensible effect produced at the first instant by the cause of the passion, greatly agitates the frame; its influence is immediately communicated to the whole nervous system, and the commotions excited in that, indicate themselves both by attitudes and motions of the body, and particular expressions of countenance. These effects are such universal concomitants that no very important change in the state of the mind can take place, without some visible change of a correspondent nature in the animal economy.

Emotions, therefore, according to the genuine signification of the word, are principally and primitively applicable to the sensible changes and visible effects which particular passions produce upon the frame, in consequence of this re-action, or particular agitation of mind. It is alone by these visible effects that the subject is discovered to be under the influence of any passion; and it is alone by the particular changes produced, or kind of emotion, that we are enabled to judge of the nature of the passion. Thus, although the passion exists prior to the emotions, yet as these are its external signs, they must indicate its continued influence as long as they continue to agitate the system. In consequence of this immediate connection, the words *passions* and *emotions* are, in familiar discourse, where no philosophical precision is requisite, used synonymously; though, in reality, the latter are uniformly the effects of the former. Here, as in innumerable other instances, figurative modes of expression are adopted. The Synecdoche is perpetually employed, by which cause and effect are confounded, or substituted the one for the other. Since emotions are faithful indications of their correspondent passions, and strong passions are always productive of emotions, we should deem it a pedantic precision to select, at all times, the appropriate word, when we mean simply to express the general effect.

However, the term emotion is sometimes expressive of lively sensations which do not produce visible effects in any degree proportionate to their feelings. In emotions the mind is not so completely or necessarily passive. In general it possesses some power over the external signs; and in many cases where the feelings would be too strong to remain concealed, were they totally uncontrouled, some other influential affection either of fear, respect, humanity, &c. may serve to repress or moderate their effect, and confine them to inward emotions.

Again, the term is frequently employed to mark the first impression which particular objects make upon susceptible minds, whether they remain concealed or not. Thus in the fine arts, the charms of musical compositions which are novel to us; the first view of a gallery of paintings possessing distinguished merit; the surprise of a beautiful or elevated sentiment, or poetic description, will generally make a more vivid impression upon us, than that which is felt in a continued or renewed contemplation of the same subjects; and yet these impressions may not be so forcible as to produce the transports accompanying emotions from other causes. Yet this difference is simply in degree, not in kind. This species of enjoyment is peculiar to minds highly cultivated, whose repeated enjoyments of a similar nature have gradually moderated transports; and whose emotions have gradually subsided into gentler undulations, if we may thus express it, in place of those agitations which the unexperienced would inevitably betray upon similar occasions. (*Cogan on the Passions*, p. 9.)

EMOUI, or HIA-MEN, an island near the south-east coast of China, in the province of Fo-kien, about fifteen miles in circumference, with a port capable of containing any number of vessels, with sufficient depth of water; where the emperor keeps a garrison of several thousand men. In the beginning of this century it was frequented by European vessels for trade, but is now neglected for Canton. Lon. 116. 27 E. Lat. 24. 30 N.

To EMPA'LE. *v. a.* (*empaler*, French.) 1. To fence with a pale (*Donne*). 2. To fortify (*Raleigh*). 3. To enclose; to shut in (*Cleaveland*). 4. To put to death by spitting on a stake fixed upright (*Southern*).

EMPALEMENT, in botany. See CALYX.

EMPA'NNEL. *s.* (from *panne*, Fr.) The writing or entering the names of a jury into a schedule, by the sheriff, which he has summoned to appear (*Cowell*).

To EMPA'NNEL. *v. a.* (from the noun.) To summon to serve on a jury (*Government of the Tongue*).

EMPA'RLANCE. *s.* (from *parler*, Fr.) In common law, a desire or petition in court of a day to pause what is best to do (*Cowell*).

EMPA'SM. *s.* (εμπασσω.) A powder to correct the bad scent of the body.

To EMPA'SSION. *v. a.* (from *passion.*) To move with passion; to affect strongly (*Milton*).

EMPEDOCLES, a philosopher, poet, and historian, of Agrigentum, in Sicily, who flourished 444 B C. He warmly adopted the doctrine of transmigration, and wrote a poem upon the opinions of Pythagoras, very much commended, in which he spoke of the various bodies which nature had given him. He was first a girl, afterwards a boy, a shrub, a bird, a fish, and lastly Empedocles. His poetry was bold and animated, and his verses were so universally esteemed, that they were publicly recited at the Olympic games with those of Homer and Hesiod. He shewed himself an inveterate enemy to tyranny, and refused to become the sovereign of his country. It is reported that his curiosity to visit the flames of the crater of Ætna proved fatal to him. Some maintain that he wished it to be believed that he was a god, and that his death might be unknown, he threw himself into the crater, and perished in the flames. His expectations, however, were frustrated, and the volcano, by throwing up one of his sandals, discovered to the world that Empedocles had perished by fire. Others report that he lived to an extreme old age, and that he was drowned in the sea. Empedocles was the first who, combining the opinions of earlier philosophers into one system, admitted four elements, fire, water, earth, and air.

Whatever be thought of the philosophical attainments, or the magical skill of Empedocles, his poetical powers are attested by the remaining fragments of his works, and the eulogium of ancient writers who possessed them entire. His books on nature, and his expiations, contained, as we are told by Laertius, five thousand verses; and a work on medicine six hundred. Lucretius places him above all the wonders of the island in which he dwelt. (Lucret. de Nat. I. 717.)

To EMPE'OPLE. *v. a.* (from *people.*) To form into a people or community (*Spensor*).

EMPERESS, or EMPRESS. *s.* (from *emperour.*) 1. A woman invested with imperial power (*Davies*). 2. The queen of an emperour (*Shakspeare*).

EMPEROUR. (*imperator.*) Amongt he ancient Romans, signified a general of an army, who for some extraordinary success had been complimented with this appellation. Thus Augustus, having obtained no less than twenty famous victories, was as often saluted with the title of emperour. And Titus was denominated emperour by his army after the reduction of Jerusalem. Afterwards it came to denominate an absolute monarch, or supreme commander of an empire. In this sense it was applied to Julius Cæsar, to Octavius, Tiberius, &c. afterwards it became elective. In strictness, this title does not add any thing to the rights of sovereignty: its effect is only to give precedence and pre-eminence over other sovereigns, and, as such, it raises those invested with it to the summit of all human greatness.

In the East, the title of emperour is more frequently applied than among Europeans; it is given to the sovereigns of China, Japan, Mogul, Persia, &c. In the west it has been for a long time restrained to the emperours of Germany. (See EMPIRE.) The chief rights of the German emperours were in 1437 reduced to the following: That of conferring all dignities and titles, except the privilege of being a state of the empire; of *preces primariæ*, or of appointing once during their reign a dignitary in each chapter or religious house; of granting dispensations with respect to the age of majority; of erecting cities, and conferring the privilege of coining money; of calling the meetings of the diet, and presiding in them.

To these some have added, 1. That all the princes and states of Germany are obliged to do them homage, and swear fidelity to them. 2. That they, or their generals, have a right to command the forces of all the princes of the empire, when united together. 3. That they receive a kind of tribute from all the princes and states of the empire, for carrying on a war which concerns the whole empire, which is called the Roman month. For the rest, there is not a foot of land or territory annexed to his title: but ever since the reign of Charles IV. the emperours have depended entirely on their hereditary dominions as the only source of their power, and even of their subsistence. The emperour of Germany has been lately compelled by the emperour of the French to assume the new name of emperour of Austria in its stead; what title or what dignity he will next assign him, the great teacher, time, alone can inform us.

E'MPERY. *s.* (*empire*, French.) Empire; sovereignty: not in use (*Shakspeare*).

E'MPETRUM. Crow-berry. Crake-berry. Berry-bearing heath. In botany, a genus of the class dioecia, order triandria. Calyx three-parted; petals three. Male; stamens from three to nine, capillary, very long. Female; stigmas nine; berry superior; from three to nine-seeded. Two species.

1. E. album; with erect stems, pubescent branchlets, and white berries or fruit; a native of Portugal.

2. E. nigrum, with procumbent stems, and black berries; four on our own heaths; the berries eaten by grouse, and some other birds, but generally refused by quadrupeds.

EMPHASIS, in rhetoric, a force, stress, or energy, in expression, action, gesture, or the like, which performs the same office in sentences as the accent does in words. The word is Greek, εμφασις, which signifies the same. See ENERGY.

By emphasis is usually meant a stronger and fuller sound of voice, by which we distinguish some word or words, on which we design to lay particular stress, and to shew how they affect the rest of the sentence. Sometimes the emphatic words must be distinguished by a particular tone of voice, as well as by a particular stress.

Emphasis may be divided into the superior and the inferior emphasis. The superior emphasis determines the meaning of a sentence with reference to something said before, presupposed by the author as general knowledge, or removes an ambiguity, where a passage may have more senses than one. The inferior emphasis enforces, graces, and enlivens, but does not fix the meaning of any passage.

The superior emphasis finds place in the following short sentence, which admits of four distinct meanings, each of which is ascertained by the emphasis only.

"Do you ride to town to-day?"

The following examples illustrate the nature and use of the inferior emphasis:

"Many persons mistake the *love* for the *practice* of virtue."

"Shall I reward his services with *falsehood?* Shall I forsake *him* who cannot forget *me?*"

"If his principles are *false*, no apology from *himself* can make them *right*: if founded in *truth*, no censure from *others* can make them *wrong*."

The superior emphasis, in reading as in speaking, must be determined entirely by the sense of the passage, and always made alike; but as to the inferior emphasis, taste alone seems to have the right of fixing its situation and quantity.

It is a great error to multiply emphatical words too much, and use the emphasis indiscriminately. It is only by a prudent reserve and distinction in the use of emphatical words, that we can give them any weight. To crowd every sentence with such words, is like crowding all the pages of a book with Italic characters; which, as to the effect, is just the same as to use no distinctions at all.

EMPHA'TICAL. EMPHA'TICK. *s.* (εμφαινω.) 1. Forcible; strong; striking (*Garth*). 2. Striking the sight (*Boyle*).

EMPHA'TICALLY. *ad.* (from *emphatical.*) 1. Strongly; forcibly; in a striking manner. 2. According to appearance (*Brown*).

EMPHRA'CTICS. (εμφρακτικα, from εμφραττω, to obstruct.) Cutaneous astringents. Medicines that obstruct the cutaneous pores.

EMPHYSE'MA. (*emphysema*, εμφυσημα, from εμφυσαω, to inflate.) Air in the cellular membrane. See PNEUMATOSIS.

EMPHYSE'MATOUS. *a.* (from εμφυσημα.) Bloated; puffed up; swollen (*Sharp*).

To EMPIE'RCE. *v. a.* (from *pierce.*) To pierce into; to enter into by violent appulse (*Spenser*).

EMPI'GHT. *part.* (from *to pitch*.(Set; fixed; fastened (*Spenser*).

E'MPIRE. *s.* (*empire*, French.) 1. Imperial power; supreme dominion (*Rowe*). 2. The region over which dominion is extended (*Temple*). 3. Command over any thing.

EMPIRE. (*imperium.*) In political geography, a large extent of land, under the jurisdiction or government of an emperor. (See EMPEROR.) In ancient history we read of four great monarchies or empires, viz. that of the Babylonians, Chaldeans, and Assyrians; that of the Medes and Persians; that of the Greeks; and that of the Romans. The first subsisted from the time of Nimrod, who founded it in the year of the world 1800, according to the computation of Usher, to Sardanapalus their last king, in 3257, and consequently lasted above 1450 years. The empire of the Medes commenced under Arbace, in the year of the world 3257, and was united to that of the Babylonians and Persians under Cyrus, in the year 3468, and it closed with the death of Darius Codomannus, in 3674. The Grecian empire lasted only during the reign of Alexander the Great, beginning in the year of the world 3674, and terminating with the death of this conqueror in 3681, his conquests being divided among his captains. The Roman empire commenced with Julius Cæsar, when he was made perpetual dictator, in the year of the city 708, and of the world 3956, forty-eight years after Christ. The seat of the empire was removed to Byzantium by Constantine, in the year of our Lord 334; the east and west were then united under the title of the Roman empire, till the Romans proclaimed Charlemagne emperor, A.D. 800.

EMPIRE, or *The Empire*, used absolutely and without any addition, signifies the empire of Germany; called also, in juridical acts and laws, the holy Roman empire. It had its beginning with the ninth century; Charlemagne being created first emperor by pope Leo III. who put the crown on his head in St. Peter's church, on Christmas day, in the year 800.

EMPIRIC. (*empiricus*, εμπειρικος, from εν, in, and πειρα, experience.) One who practises the healing art upon experience, and not theory. This is the true meaning of the word and the sense in which it was originally applied in opposition to the methodists, or methodic practitioners, who were actuated by some system or other, but it is now applied, in a very opposite sense, to those who deviate from the line of conduct pursued by scientific and regular practitioners, and vend nostrums, or sound their own praise in the public papers.

EMPI'RICAL. Empi'rick. *a.* (from the noun.) 1. Versed in experiments (*Milton*). 2. Known only by experience; practised only by rote (*Shakspeare*).

EMPI'RICALLY. *ad.* (from *empirical.*) 1. Experimentally; according to experience. 2. Without rational grounds; charlatanically.

EMPI'RICISM. *s.* (from *empirick.*) Dependence on experience without knowledge or art; quackery.

E'MPIS, in zoology, a genus of the class insecta, order diptera. Mouth with an inflected sucker and proboscis; sucker with a single-valved sheath, and three bristles; feelers short, filiform; antennas setaceous. This is one of the many tribes of insects that live by sucking out the blood and juices of other animals. Twenty-nine species: a few have been observed in Barbary; the rest are inhabitants of Europe, five of them common to our own country. See Nat. Hist. Plate XC.

EMPLA'STER. *s.* (εμπλαςρον.) An application to a sore of an oleaginous or viscous substance, spread upon cloth (*Wiseman*).

To Empla'ster. *v. a.* (from the noun.) To cover with a plaster (*Mortimer*).

EMPLA'STIC. *a.* (εμπλαςικος.) Viscous; glutinous (*Wiseman*).

EMPLASTRA, in pharmacy, plasters, or emplasters, as above: combinations of fixed oil, or animal fat, with other substances, of such a consistency that when cold, the preparation does not adhere to the fingers, but becomes soft and plastic when gently heated. The following are those chiefly in use.

Emplastrum ammoniaci cum hydrargyro. This mixture of ammoniacum, hydrargyrus and sulphurated oil is said to possess resolvent virtues, and the plaster is recommended with this view to be applied to nodes, tophs, indurated glands, and tumours.

E. asafœtidæ. This plaster, ordered by the Edinburgh pharmacopœia, is said to possess anodyne and antispasmodic virtues. It is, therefore, occasionally directed to be applied to the umbilical region in hysterical cases.

E. cantharidis. The virtues of this plaster are enumerated under the title of Cantharides.

E. ceræ compositum. This is a gently drawing preparation, calculated to promote a moderate discharge from a blistered surface, with which intention it is mostly used. Where the stronger preparations irritate, this will be found, in general, to agree.

E. cumini. A warm stomachic plaster, which, when applied to the stomach, expels flatulency. To indolent scrophulous tumours, where the object is to promote suppuration, this is an efficacious plaster.

E. ladani compositum. This may be used with the same intentions as the cumin plaster, to which it is in no way superior, though composed of more expensive materials.

E. lithargyri. Excoriations of the skin, slight burns, and the like may be covered with this plaster: but it is in more general use as a defensitive, where the skin becomes red from lying a long time on the part.

E. lithargyri compositum. This is a warm, stimulating, and suppurative plaster, calculated to promote maturation of indolent or scirrhous tumours, and to allay the pains of sciatica, arthodynea, &c.

E. lithargyri cum hydrargyro. Plasters of this compound are frequently applied to resolve venereal bubos, nodes, tophs, and swelled joints from the same cause.

E. lithargyri cum resina. This is the common adhesive plaster used by surgeons to retain dressings in their places, and to keep together the edges of wounds, ulcers, &c.

E. picis Burgundicæ compositum. From the slight degree of redness this stimulating application produces, it is adapted to gently irritate the skin, and thus relieve rheumatic pains. Applied to the temples it is sometimes of use in pains of the head.

E. saponis. Discutient properties are attributed to this elegant plaster, with which view it is applied to lymphatic and other indolent tumours. It forms an admirable, defensitive, and soft application, spread on linen, to surround a fractured limb.

E. thuris compositum. This plaster is said to possess strengthening, as well as adhesive powers. By keeping the skin firm, it may give tone to the relaxed muscles it surrounds, but cannot, in any other way, impart more strength than the common adhesive plaster.

To EMPLE'AD. *v. a.* To endict; to prefer a charge against; to accuse (*Hayward*).

EMPLE'URUM, in botany, a genus of the class monœcia, order tetrandria. Male: calyx four-cleft; corolless. Fem. calyx four-cleft, inferior; corolless; stigmas cylindrical, placed on the lateral tooth of the germ; capsule opening on the side: seed one-coated. One species: a Cape shrub, with wandlike branches, and lateral few-flowered peduncles.

To EMPLO'Y. *v. a.* (*employer*, French.) 1. To busy; to keep at work (*Temple*). 2. To use as an instrument (*Gay*). 3. To use as means (*Dryden*). 4. To use as materials (*Locke*). 5. To commission; to intrust with the management of any affairs (*Watts*). 6. To fill up with business (*Dryden*). 7. To pass or spend in business (*Prior*).

Emplo'y. *s.* (from the verb.) 1. Business; object of industry (*Pope*). 2. Publick office (*Addison*).

EMPLO'YABLE. *a.* (from *employ.*) Capable to be used; proper for use (*Boyle*).

EMPLO'YER. *s.* (from *employ.*) 1. One that uses or causes to be used (*Child*). 2. One that sets others to work.

EMPLO'YMENT. *s.* (from *employ.*) 1. Business; object of industry; object of labour. 2. Business; the state of being employed. 3. Office; post of business (*Atterbury*). 4. Business intrusted (*Shakspeare*).

To EMPO'ISON. *v. a.* (*empoisonner*, Fr.) 1. To destroy by poison; to destroy by venomous food or drugs (*Sidney*). 2. To taint with poison; to envenom.

EMPO'ISONER. *s.* (*empoisonneur*, Fr.) One who destroys another by poison (*Bacon*).

EMPO'ISONMENT. *s.* (*empoisonnement*, French.) The practice of destroying by poison (*Bacon*).

EMPORE'TICK. *a.* (εμπορετικος.) That is used at markets, or in merchandise.

EMPORIUM, in ancient geography, two cities near Placentia; one well fortified, and guarded by a strong garrison, at which Hannibal met a repulse; the other, Hannibal took and plundered. Now thought to be Pont-Nura, in the duchy of Placentia.

EMPO'RIUM. *s.* (εμποριον.) A place of merchandise; a mart; a commercial city (*Dryden*).

EMPORIUM, in medicine, is often used for the common sensory in the brain.

To EMPO'VERISH. *v. a.* (*pauvre*, Fr.) 1. To make poor; to depauperate; to reduce to indigence (*South*). 2. To lessen fertility.

EMPO'VERISHER. *s.* (from *empoverish*.) 1. One that makes others poor. 2. That which impairs fertility (*Mortimer*).

EMPO'VERISHMENT. *s.* (from *empoverish*.) Cause of poverty; drain of wealth (*Swift*).

To EMPO'WER. *v. a.* (from *power*.) 1. To authorize; to commission (*Dryden*). 2. To give natural force; to enable (*Baker*).

E'MPRESS. *s.* (contracted from *emperess*.) 1. The queen of an emperour. 2. A female invested with imperial dignity; a female sovereign (*Milton*).

EMPRI'SE. *s.* (*emprise*, Fr.) Attempt of danger; undertaking of hazard; enterprise (*Pope*).

EMPROSTHOTONUS. (*emprosthotonus*, εμπροσθοτονος, from εμπροσθεν, before, or forwards, and τεινω, to draw.) A tonic spasm of several muscles, so as to keep the body in a fixed position and bent forward. Cullen considers it as a species of tetanus. See TETANUS.

E'MPTIER. *s.* (from *empty*.) One that empties; one that makes any place void (*Nahum*).

E'MPTINESS. *s.* (from *empty*.) 1. Absence of plenitude; inanity (*Philips*). 2. The state of being empty (*Shakspeare*). 3. A void space; vacuity; vacuum (*Bentley*). 4. Want of substance or solidity (*Dryden*). 5. Unsatisfactoriness; inability to fill up the desires (*Atterbury*). 6. Vacuity of head; want of knowledge (*Pope*).

E'MPTION. *s.* (*emptio*, Lat.) The act of purchasing; a purchase (*Arbuthnot*).

E'MPTY. *a.* (æmtiᵹ, Saxon.) 1. Void; having nothing in it; not full (*Shakspeare*). 2. Evacuated; no longer full (*Spenser*). 3. Devoid; unfurnished (*Newton*). 4. Unsatisfactory; unable to fill the mind or desires (*Pope*). 5. Without any thing to carry; unburdened; unfreighted (*Dryden*). 6. Hungry (*Shakspeare*). 7. Vacant of head; ignorant; unskilful (*Raleigh*). 8. Unfruitful; barren (*Genesis*). 9. Without substance; vain (*Dryden*).

To E'MPTY. *v. a.* (from the adjective.) To evacuate; to exhaust (*Arbuthnot*).

To EMPU'RPLE. *v. a.* (from *purple*.) To make of a purple colour (*Milton*).

EMPUSA, among the ancients, a kind of hobgoblin, or bugbear, under the direction of Hecate, sent to frighten people who laboured under misfortunes.

To EMPU'ZZLE. *v. a.* (from *puzzle*.) To perplex; to put to a stand (*Brown*).

EMPYE'MA. (*empyema*, εμπυημα, from εν, within, and πυον, pus.) A collection of pus in the cavity of the thorax. It is one of the terminations of pleuritis.

EMPY'REAL. *a.* (εμπυρος.) Formed of the element of fire; refined beyond aerial (*Milton*).

EMPYRE'AN. *s.* (εμπυρος.) The highest heaven where the pure element of fire is supposed to subsist (*Milton*).

EMPYREUM, a term used by divines for the highest heaven, where the blessed enjoy the beatific vision. The word is formed of εν, and πυρ, fire, because of its splendour.

EMPYRE'UMA. (*empyreuma*, εμπυρευμα, from εμπυρευω, to kindle, and πυρ, fire.) The offensive smell that distilled waters and other substances receive from being too much exposed to ignition.

EMPYREUMATIC. Smelling as it were burnt: thus empyreumatic oils are those distilled with a great heat, and impregnated with a smell of the fire.

EMPYRO'SIS. *s.* (εμπυροω.) Conflagration; general fire (*Hale*).

EMRODS. See HEMORRHOIDS.

To E'MULATE. *v. a.* (*æmulor*, Latin.) 1. To rival; to propose as one to be equalled or excelled. 2. To imitate with hope of equality, or superiour excellence (*Ben Jonson*). 3. To be equal to; to rise to equality with (*Pope*). 4. To imitate; to copy (*Arbuthnot*).

EMULATION, a generous ardour kindled by the praiseworthy examples of others, which impels us to imitate, to rival, and, if possible, to excel them. This passion involves in it esteem of the person whose attainments or conduct we emulate, of the qualities and actions in which we emulate him, and a desire of resemblance, together with a joy springing from the hope of success. The word comes originally from the Greek αμιλλα, dispute, contest; whence the Latin *æmulus*; and thence our emulation. Plato observes of emulation, that it is the daughter of envy; if so, there is a great difference between the mother and the offspring; the one is a virtue and the other a vice. Emulation admires great actions, and strives to imitate them; envy refuses them the praises that are their due; emulation is generous, and only thinks of surpassing a rival; envy is low, and only seeks to lessen him. It must be confessed, however, that there is great danger of emulation degenerating into envy; and it, therefore, becomes indispensably necessary for those concerned in the important work of education, to take care lest they have recourse to improper motives, and thereby, instead of producing the generous sentiments of emulation, engender the baleful propensities of envy and malignity.

E'MULATIVE. *a.* (from *emulate.*) Inclined to emulation: rivalling; disposed to competition.

EMULA'TOR. *s.* (from *emulate.*) A rival; a competitor (*Bacon*).

To EMU'LGE. *v. a.* (*emulgeo*, Latin.) To milk out.

EMU'LGENT. *a.* (*emulgens*, Latin.) 1. Milking or draining out.

Emulgent vessels. (*vasa emulgentia*, from *emulgeo*, to milk out: applied to the veins and arteries which go from the aorta and vena cava to the kidneys, because the ancients supposed they strained, and, as it were, milked the serum through the kidneys.) Renal vessels. The vessels of the kidneys are so termed. The emulgent artery is a branch of the aorta. The emulgent vein evacuates its blood into the ascending cava.

E'MULOUS. *a.* (*æmulus*, Latin.) 1. Rivalling; engaged in competition (*Jonson*). 2. Desirous of superiority; desirous to rise above another; desirous of any excellence possessed by another (*Prior*). 3. Factious; contentious (*Shakspeare*).

E'MULOUSLY. *ad.* (from *emulous.*) With desire of excelling or outdoing another (*Granville*).

EMULSIO ARA'BICA. Emulsion of gum Arabic. This cooling and demulcent emulsion, ordered in the Edinburgh pharmacopœia, may be drank *ad libitum* to mitigate ardor urinæ, whether from the venereal virus, or any other cause. In difficult and painful micturition and strangury, it is of infinite service.

Emulsio camphorata. A much more useful form of giving camphire than that directed by the London pharmacopœia; yet a great quantity of the camphire is unnecessarily lost in this preparation. It is calculated for the stomachs of those who can only bear small quantities of camphire.

EMULSION. (*emulsio.*) A soft and somewhat oily medicine, resembling milk; formed by an imperfect combination of oil with water, by means of mucilage, &c.

EMUNCTORY. (*emunctorium*, from *emungo*, to drain off.) The excretory ducts of the body are so termed: thus the exhaling arteries of the skin constitute the great emunctory of the system.

EN, an inseparable particle borrowed by us from the French, and by the French formed from the Latin *in*. Many words are uncertainly written with *en* or *in*. In many words *en* is changed into *em*, for more easy pronunciation.

To ENA'BLE. *v. a.* (from *able.*) To make able; to empower (*Rogers*).

To ENA'CT. *v. a.* (from *act.*) 1. To act; to perform: not in use (*Spenser*). 2. To establish by law; to decree (*Temple*). 3. To represent by action (*Shakspeare*).

Ena'ct. *s.* (from the verb.) Purpose; determination.

ENA'CTOR. *s.* (from *enact.*) 1. One that forms decrees, or establishes laws (*Atterbury*). 2. One that practises or performs any thing: not used (*Shakspeare*).

ENÆ'MA. (εναιμα, from εν and αιμα, blood.) A styptic. Any medicine appropriated to bleeding wounds.

ENA'LLAGE. *s.* (εναλλαγη.) A figure in grammar, whereby some change is made in the common modes of speech, as when one mood or tense of a verb is put for another.

To ENA'MBUSH. *v. a.* (from *ambush.*) To hide in ambush; to hide with hostile intention (*Chapman*).

To ENA'MEL. *v. a.* (from *amel.*) 1. To inlay; to variegate with colours (*Pope*). 2. To lay upon another body so as to vary it (*Milton*).

To Ena'mel. *v. n.* To practise the use of enamel (*Boyle*).

Ena'mel. *s.* (from the verb.) 1. Any thing enamelled, or variegated with colours fixed by fire (*Fairfax*). 2. The substance inlaid in other things.

Enamel, in anatomy. See Dentes and Teeth.

Enamel, in general, signifies a vitrified matter, interspersed with some solid substance, and possessing all the properties of glass, excepting that of transparency.

The basis of enamels is a pure crystal glass or frit, ground together with a fine calx of lead and tin, prepared for that purpose, with the addition of a small proportion of the white salt of tartar. These form the principal ingredients of all enamels, which are made by adding various pulverised colours, and thoroughly incorporating the whole in a furnace. For white enamel, it is sufficient to add manganese to the matter which constitutes the basis; for azure, zaffre mixed with calx of brass; for green, calx of brass with scales of iron, or crocus martis; for black, zaffre with manganese or crocus martis, or manganese with tartar; for red, manganese, or calx of copper with red tartar; for purple, manganese with calx of brass; for yellow, tartar and manganese; lastly, for violet coloured enamel, manganese with brass, that has been three times calcined.

Enamels are used either for the counterfeiting or imitating of precious stones, and for painting; or by enamellers and artists working in gold, silver, and other metals. That species of enamel which jewellers employ, is imported from Holland, or Venice, in small cakes of various sizes, which are in general about four inches in diameter, and have the mark of the maker indented on them. It pays a duty of 3*s.* 8*d.* per pound on importation; and is allowed a drawback of 1*s.* 6*d.* per pound on being again exported.

ENA'MELLER. *s.* (from *enamel.*) One that practises the art of enamelling.

ENAMELLING, the art of laying enamel upon metals, as gold, silver, copper, &c. and of melting it at the fire, or of making divers curious works in it at a lamp. It signifies also to paint in enamel.

The delicate and beautiful art of enamelling consists in the application of a smooth coating of vitrified matter (transparent or opaque, and with or without colour, figures, and other ornaments), to a bright polished metallic substance. It is, therefore, a kind of varnish made of glass, and melted upon the substance to which it is applied, and affording a fine uniform ground for an infinite variety of ornaments which are also fixed on by heat.

The general principles on which enamelling is founded, are on the whole very simple, but, perhaps, there is none of all the chemico mechanical arts which requires, for the finer parts, a greater degree of practical skill and dexterity, and of patient and accurate attention to minute processes.

The concealment observed by those who profess this art, is proportioned to the difficulty of acquiring it; the general chemist must, therefore, content himself with the general principles of enamelling, and the detail of those particulars that are commonly known.

Though the term enamelling is usually confined to the ornamental glazing of metallic surfaces, it strictly applies to the glazing of pottery or porcelain, the difference being only in the latter, the surface is of baked clay. With regard to the composition of coloured enamels (which are all tinged by different metallic oxyds) a very general account of the substances used will suffice in this place, and the rest of the subject may be properly referred to the article of coloured Glass. The enamelling on metals, therefore, will only be noticed in this place. The only metals that are enamelled, are gold and copper; and with the latter, the opaque enamels are only used. Where the enamel is transparent and coloured, the metal chosen should be of that kind, as not only to have its surface unalterable when fully red hot, but also to be in no degree chemically altered by the close contact of melted glass, containing an abundance of some kind of metallic oxyd. This is the chief reason why coloured enamelling on silver is impracticable, though the brilliance of its surface is not impaired by mere heat, for if (for example) an enamel made yellow with oxyd of lead or antimony is laid on a surface of bright silver, and kept melted on it for a certain time, the silver and the enamel act on each other so powerfully, that the colour soon changes from a yellow to an orange, and lastly to a dirty olive. Copper is equally altered by the coloured enamels, so that gold is the only metal which can bear the long contact of the coloured glasses at a full red heat, without being altered by them.

The simplest kind of enamel is that fine white opaque glass, which is applied to the dial plate of watches. The process of laying it on (which may serve as a general example of the art) is the following.

A piece of thin copper sheet, hammered of the requisite convexity, is first accurately cut out, a hole drilled in the middle for the axis of the hands, and both the surfaces made perfectly bright with a scratch brush.

A small rim is then made round the circumference, with a thin brass band rising a little above the level, and a similar rim round the margin of the central hole. The use of these is to confine the enamel when in fusion, and keep the edges of the plate quite neat and even. The substance of the enamel is a fine white opaque glass, the material of which will be presently mentioned. This is bought in lump by the enamellers, and is first broken down with a hammer, then ground to a sufficiently fine powder, with some water in an agate mortar; the superfluous water being then poured off, the pulverised enamel remains of about the consistence of wetted sand, and is spread very evenly over the surface of the copper plate by many dexterous manipulations. On most enamellings, and especially on this, it is necessary also to counter enamel the under concave surface of the copper plate, to prevent its being drawn out of its true shape, by the unequal shrinking of the metal and enamel on cooling. For this kind of work, the counter enamel is only about half the thickness on the concave as on the convex side. For flat plates, the thickness is the same on both sides.

The plate, covered with the moist enamel powder, is warmed and thoroughly dried, then gently set upon a thin earthen ring, that supports it only by touching the outer rim, and put gradually into the red hot muffle of the enameller's furnace. This furnace is constructed somewhat like the assay furnace, but the upper part alone of the muffle is much heated, and some peculiarities are observed in the construction, to enable the artist to govern the fire more accurately.

The precise degree of fire to be given here as in all enamelling, is that at which the particles of the enamel run together into an uniform pasty consistence, and extend themselves evenly over the surface, shewing a fine polished face, carefully avoiding on the other hand so great a heat as would endanger the melting of the thin metallic plate. When the enamel is thus seen to sweat down, as it were, to an uniform glossy glazing, the piece is gradually withdrawn and cooled, otherwise it would fly by the action of the cold air

A second coating of enamel is then laid on and fired as before, but this time the finest powder of enamel is taken, or that which remains suspended in the washings. It is then ready to receive the figures and division marks, which are made of a black enamel, ground in an agate mortar, with much labour, to a most impalpable powder, worked up on a pallet with oil of lavender, or spike, and laid on with an extremely fine hair brush. The plate is then stoved to evaporate the essential oil, and the figures burnt in as before. The polishing with tripoli, and minuter parts of the process, need not be here mentioned.

If the enamel be chipped off a dial plate (which may be done with the utmost ease by bending it backwards and forwards, as the adhesion between the metal and glazing is very slight) the part immediately in contact with the copper will be found deeply and nearly uniformly browned, which shews how unfit copper alone would be for the transparent enamels.

The regulation of the fire appears to be the most difficult of all the parts of this nice process, particularly in the fine enamelling of gold for ornamental purposes, of designs, miniatures, and the like, where three, four, or sometimes five separate firings are required. If the heat is too low, the enamel does not spread and vitrify as it ought; if too high, it may be enough to melt the metal itself, whose fusing point is but a small step above that of the enamel, or else (what is an equal mortification to the artist) the delicate figures, laid on with so much care and judgment, melt down in a moment, and the piece exhibits only a confused assemblage of lines, and fragments of designs.

The exact composition of the opaque white enamel, is a matter of considerable importance, and is procured by the enamellers from persons whose business it is to prepare it. A good enamel of this kind, fit to be applied to porcelain and metals, should be of a very clear fine white, so nearly opaque, as only to be translucent at the edges; and at a moderate red heat it should run into that kind of paste, or imperfect fusion which allows it to extend itself freely and uniformly, and to acquire a glossy even surface, without, however, fully melting into a thin glass. The opaque white of this enamel is given by the oxyd of tin, which possesses, even in a small proportion, the property of rendering vitrescent mixtures white and opaque, or in still less proportion, milky; and when otherwise coloured, opalescent. The oxyd of tin is always mixed with three or four times its quantity of oxyd of lead; and it appears necessary that the metals should be previously mixed by melting, and the alloy then calcined. The following are the directions given by Clouet for the composition of this enamel. Mix 100 parts of pure lead with from 20 to 25 of the best tin, and bring them to a low red heat in an open vessel. The mixture then burns nearly as rapidly as charcoal, and oxidates very fast. Skim off the crusts of oxyd, successively formed, till the whole is thoroughly calcined. It is better then to mix all the skimmings, and again heat as before, till no flame arises from them, and the whole is of an uniform grey colour. Take 100 parts of this oxyd, 100 of sand, and 25 or 30 of common salt, and melt the whole in a moderate heat. This gives a greyish mass, often porous and apparently imperfect, but which, however, runs to a good enamel when afterwards heated. This is the enamel used for porcelain, but for metals and finer works the sand is previously calcined in a very strong heat with a fourth of its weight, or, if a more fusible compound is wanted, as much of the oxyd of tin and lead as of salt is taken, and the whole melted to a white porous mass. This is then employed instead of the rough sand as in the above-mentioned process. The above proportions, however, are not invariable, for if more fusibility is wanted, the dose of oxyd is increased, and that of the sand diminished, the quantity of common salt remaining the same. The sand employed in this process, according to Mr. Clouet, is not the common sort, however fine, but a micaceous sand, in which the mica forms about one-fourth of the mixture.

Neri, in his valuable treatise on glass-making, has given long ago the following proportions for the common material of all the opaque enamels, which Kunckel and other practical chemists have confirmed. Calcine 30 parts of lead, with 33 of tin, with the precautions mentioned above. Take of this calcined mixed oxyd 50 pounds, and as much of powdered flints (prepared by being thrown into water when red hot, and then ground to powder), and eight ounces of salt of tartar; melt the mixture in a strong fire kept up for ten hours, after which reduce the mass to powder. This is the common material for the opaque enamels, and is of a grey white. To make this fine enamel quite white, mix six pounds of this material with 48 grains of the best black oxyd of manganese, and melt in a clear fire. When fully fused, throw it into cold water, then re-melt and cool as before two or three times, till the enamel is quite white and fine. Kunckel observes on this process, that he tried it without the oxyd of manganese, but the enamel, instead of being milk white, was blueish and not good, so that there is no doubt but that this oxyd is highly important. If too much is used, the enamel becomes of a rose purple. For further observations on the use of manganese in vitrescent mixtures, see the article GLASS. Coloured enamels are composed of a common basis, which is a fusible mixture of vitrifiable materials, and of some metallic oxyd. In general, the coloured enamels are required to be transparent, in which case the basis is a kind of glass composed of borax, sand, and oxyd of lead, or other vitrescent mixtures, in which the proportion of saline or metallic flux is more or less according to the degree of heat that the colouring oxyd will bear without decomposition. When the coloured enamel is to be opaque, or opalescent, a certain portion of the white opaque enamel, or of the oxyd of tin, is added to the mixture. The most beautiful and costly colour known in enamelling is an exquisitely fine rich red, with a purplish tinge, given by the salts and oxyds of gold, especially the purple precipitate, formed by tin in one form or other, and nitro muriat of gold, and also by the fulminating gold. This beautiful colour requires much skill in the artist to be fully brought out. It is said that when most perfect it should come from the fire quite colourless, and afterwards receive its colour by the flame of a candle. Gold colours will not bear a violent fire.

Other and common reds are given by the oxyd of iron, but this requires the mixture of alumine, or some other substance refractory in the fire, otherwise at a full red heat the colour will degenerate into black.

Yellow is given either by the oxyd of silver alone, or by the oxyds of lead and antimony, with similar mixtures to those required for iron. The silver is as tender a colour as gold, and readily injured or lost in a high heat.

Green is given by the oxyd of copper, or it may also be procured by a mixture of blue and yellow colours.

Blue is given by cobalt; and this seems of all enamel colours the most certain, and easily manageable.

Black is produced by a mixture of cobalt and manganese.

Under the article of coloured Glasses, this subject will be noticed more at length.

The reader may conceive how much the difficulties of this nice art are increased, when the object is not merely to lay an uniform coloured glazing on a metallic surface, but also to paint that surface with figures and other designs, that require extreme delicacy of outline, accuracy of shading, and selection of colouring. The enamel painter has to work, not with actual colours, but with mixtures, which he only knows from experience will produce certain colours after the delicate operation of the fire; and to the common skill of the painter, in the arrangement of his pallet and choice of his colours, the enameller has to add an infinite quantity of practical knowledge of the chemical operation of one metallic oxyd on another, the fusibility of his materials, and the utmost degree of heat at which they will retain not only the accuracy of the figures which he has given, but the precise shade of colour which he intends to lay on.

Painting in enamel requires a succession of firings; first of the ground which is to receive the design, and which itself requires two firings, and then of the different parts of the design itself. The ground is laid on in the same general way as the common watch face enamelling already described. The colours are the different metallic oxyds, melted with some other vitrescent mixture, and ground to extreme fineness. These are worked up with an essential oil (that of spike is preferred, and next to it oil of lavender) to the proper consistence of oil colours, and are laid on with a very fine hair brush. The essential oil should be very pure, and the use of this, rather than any fixed oil, is probably that the whole may evaporate completely in a moderate heat, and leave no carbonaceous matter in contact with the colour when red hot, which might affect its degree of oxidation, and thence the shade of colour which it is intended to produce. As the colour of some vitrified metallic oxyds (such as that of gold) will stand only at a very moderate heat, whilst others will bear, and even require, a higher temperature to be properly fixed, it forms a great part of the technical skill of the artist to supply the different colours in proper order; fixing first those shades which are produced by the colours that will endure the highest heat, and finishing with those that demand the least heat. The outline of the design is first traced on the enamel, ground and burnt in; after which the parts are filled up gradually with repeated burnings, to the last and finest touches of the tenderest enamel.

Transparent enamels are scarcely ever laid upon any other metal than gold, on account of the discoloration produced by other metals, as already explained. If, however, copper is the metal used, it is first covered with a thin enamel coating, over which gold leaf is laid and burnt in, so that, in fact, it is still this metal that is the basis of the ornamental enamel. With regard to the vast number of important minutiæ in the selection and order of applying the colours, the management of the fire, &c. &c. almost the whole of what is known on this subject is confined to the practical artist, nor could this knowledge, if obtained, interest the general reader.

To ENA'MOUR. *v. a.* (*amour*, French.) To inflame with love; to make fond (*Dryden*).

ENA'RGEA. In botany, a genus of the class hexandria, order monogynia. Calyxless; corol six-petalled, every other petal with two glands at the base; stigma simple, berry three-celled, many-seeded; superior. One species only· a shrub indigenous to the straits of Magellan; with terminate, solitary, penduncled flowers.

ENARRA'TION. *s.* (*enarro*, Latin.) Explanation; exposition.

ENARTHRO'SIS, (*enarthrosis*, *εναρθρωσις*; from *εν*, in, and *αρθρον*, a joint.) The ball and socket joint A species of diarthrosis, or moveable connexion, in which the round head of one bone is received into the deep cavity of another, so as to admit of motion in every direction; as the head of the os femoris with the acetabulum of the os innominatum. See Articulation.

ENATA'TION. *s.* (*enato*, Latin.) The act of swimming out; escape by swimming.

ENA'UNTER. *ad.* An obsolete word explained by *Spenser* himself to mean *lest that*.

To ENCA'GE. *v. a.* (from *cage*.) To shut up in a cage; to coop up; to confine (*Donne*).

ENCALY'PTA. In botany, a genus of the class cryptogamia, order musci. Capsule cylindrical; fringe simple, of linear, erect, distinct teeth; veil campanulate, inflated, lax. Six species; all common to our own country.

To ENCA'MP. *v. n.* To pitch tents; to sit down for a time in a march (*Bacon*).

To Enca'mp. *v. a.* To form an army into a regular camp; to order to encamp (*Kings*).

ENCA'MPMENT. *s.* (from *encamp*.) 1. The act of encamping or pitching tents. 2. A camp; tents pitched in order (*Grew*).

In the regulations published by authority are particularly enjoined the following

Attentions relative to encampments. On the arrival of a brigade, or a battalion, on the ground destined for its camp, the quarter and rear guards of the respective regiments [illegible] mediately mount; and when circumstances require them, the advanced picquets will be posted. The grand guards of cavalry will be formed, and the horses picketed. The men's tents will then be pitched, and till this duty is completed, the officers are on no account to quit their troops or companies, or to employ any soldier for their own accommodation. Necessaries are to be made in the most convenient situations, and the utmost attention is required in this, and every other particular, to the cleanliness of the camp.

If circumstances will allow the ground on which a regiment is to encamp to be previously ascertained, the pioneers should make these and other essential conveniences, before the corps arrives at its encampment.

Whenever a regiment remains more than one night in a camp, regular kitchens are to be constructed. No tents, or huts, are to be allowed in front, or between the intervals of the battalions. A spot of ground for this purpose should be marked by the quarter-master, with the approbation of the commanding officer.

On arriving in a camp which is intersected by hedges, ditches, unequal or boggy ground, regiments will immediately make openings of communication, of 60 feet in width. The ground in front of the encampment is to be cleared, and every obstacle to the movement of the artillery and troops is to be removed. Commanding officers of regiments must take care that their communication with the nearest grand route is open and free from impediments.

ENCA'NTHIS. (*encanthis*, εγκανθις; from εν, in, and κανθος, the angle of the eye.) An excrescence or intumescence of the lachrymal caruncle, which is situated in the inner angle or canthus of the eye.

To ENCA'VE. *v. a.* (from *cave.*) To hide as in a cave (*Shakspeare*).

ENCAUMA. (*encauma*, εγκαυμα; from εν, in, and καιω, to burn.) *Encausis.* A pustule produced from a burn.

ENCAUSIS. (εγκαυσις, from εν, and καιω, to burn.) The cardialgia or heart-burn.

ENCAUSTIC and ENCAUSTUM, the same with enamelling and enamel. See ENAMELLING and ENAMEL.

ENCAUSTIC PAINTING, a method of painting made use of by the ancients, in which wax was employed to give a gloss to their colours, and to preserve them from the injuries of the air.

This ancient art, after having been long lost, was restored by count Caylus, a member of the Academy of Inscriptions in France; and the method of painting in wax was announced to the Academy of Painting and Belles Letters, in the year 1753; though M. Bachelier, the author of a treatise De l'Histoire & du Secret de la Peinture en Cire, had actually painted a picture in wax in 1749; and he was the first who communicated to the public the method of performing the operation of inustion, which is the principal characteristic of the encaustic painting. The count kept his method a secret for some time, contenting himself with exhibiting a picture at the Louvre in [illegible] representing the head of Minerva, painted in the manner of the ancients, which excited the curiosity of the public, and was very much admired. In the interval of suspense, several attempts were made to recover the ancient method of painting. The first scheme adopted was that of melting wax and oil of turpentine together, and using this composition as a vehicle for mixing and laying on the colours. But this method did not explain Pliny's meaning, as the wax is not burnt in this way of managing it. In another attempt, which was much more agreeable to the historian's description of encaustic painting, the wax was melted with strong lixivium of salt of tartar, and with this the colours were ground. When the picture was finished, it was gradually presented to the fire, so as to melt the wax; which was thus diffused through all the particles of the colours, so that they were fixed to the ground, and secured from the access of air or moisture. But the method of count Caylus is much more simple: the cloth or wood which he designed for the basis of his picture is waxed over, by only rubbing it simply with a piece of bees-wax; the wood or cloth, stretched on a frame, being held horizontally over, or perpendicularly before, a fire, at such a distance, that the wax might gradually melt, whilst it is rubbed on, diffuse itself, penetrate the body, and fill the interstices of the texture of the cloth, which, when cool, is fit to paint upon; but as water colours, or those that are mixed up with common water, will not adhere to the wax, the whole picture is to be first rubbed over with Spanish chalk or white, and then colours are applied to it; when the picture is dry, it is put near the fire, whereby the wax melts and absorbs all the colours.

Mr. J. H. Muntz, in a treatise on this subject, has proposed several improvements in the art of encaustic. When the painting is on cloth, he directs it to be prepared by stretching it on a frame, and rubbing one side several times over with a piece of bees-wax, or virgin-wax, till it is covered with a coat of wax of considerable thickness. In fine linen this is the only operation necessary previous to painting; but coarse cloth must be rubbed gently on the unwaxed side with a pumice stone, to take off all those knots which would prevent the free and accurate working of the pencil. Then the subject is to be painted on the unwaxed side with colours prepared and tempered with water; and when the picture is finished it must be brought near the fire, that the wax may melt and fix the colours. This method, however, can only be applied to cloth or paper, through the substance of which the wax may pass; but in wood, stone, metals or plaster, the former method of count Caylus must be observed.

Mr. Muntz has also discovered a method of forming grounds for painting with crayons, and fixing these, as well as water-colours, employed with the pencil. On the unwaxed side of a linen cloth, stretched and waxed as before, lay an even and thick coat of the colour proper for the ground; having prepared this colour by mixing some proper pigment with an equal quantity of chalk, and tempering them with water. When the colour is dry, bring the picture to the fire that the wax may melt, pass through the cloth, and fix the ground. An additional quantity of wax may be applied to the back of the picture, if that which was first rubbed on should not be sufficient for the body of colour; but as this must be laid on without heat, the wax should be dissolved in oil of turpentine, and applied with a brush, and the canvas be again exposed to the fire, that the fresh supply of wax may pass through the cloth, and be absorbed by the colour; and thus a firm and good body will be formed for working on with the crayons. If cloth and paper are joined together, the cloth must be first fixed to the straining frame, and then the paper must be pasted to it with a composition of paste made with wheaten flour, or starch, and water, and about a twelfth part of its weight of common turpentine. The turpentine must be added to the paste when it is almost sufficiently boiled, and the composition well stirred, and left to simmer over the fire for five or six minutes; let wax be dissolved in oil of turpentine to the consistence of a thin paste; and when the cloth and paper are dry, let them be held near a fire; and with a brush lay a coat of the wax and turpentine on both sides the joined cloth and paper, to such a degree of thickness, that both surfaces may shine throughout without any appearance of dull spots. Then expose the cloth to the fire or to the sun; by which means the oil will evaporate, and the wax become solid, and be fit to receive any composition of colour proper for a ground, which is to be laid on as above directed in the case of cloth without paper.

Almost all the colours that are used in oil-painting may be also applied in the encaustic method. Mr. Muntz objects, indeed, to brown, light pink, and unburnt terra di Sienna; because these, on account of their gummy or stony texture, will not admit such a cohesion with the wax as will properly fix them; but other colours which cannot be admitted in oil-painting, as red lead, red orpiment, crystals of verdigris, and red precipitate of mercury, may be used here. The crayons used in encaustic painting are the same with those used in the common way of crayon painting, excepting those that in their composition are too tenacious; and the method of using them is the same in both cases.

The encaustic painting has many peculiar advantages: though the colours have not the natural varnish or shining which they acquire with oil, they have all the strength of paintings in oil, and all the airiness of water-colours, without partaking of the apparent character or defects of either; they may be looked at in any light and in any situation, without any false glare: the colours are firm, and will bear washing; and a picture, after having been smoked, and then exposed to the dew, becomes as clean as if it had been but just painted. It may also be retouched at pleasure, without any detriment to the colours; for the new colours will unite with the old ones, without spots, as is the case in common size painting; nor is it necessary to rub the places to be retouched with oil as in oil pictures; it is not liable to crack, and easily repaired, if it should chance to suffer any injury. The duration of this painting is also a very material advantage; the colours are not liable to fade or change; no damp can affect them, nor any corrosive substance injure them; nor can the colour fall off in shivers from the canvas. However, notwithstanding all these and other advantages enumerated by the abbé Mazeas and Mr. Muntz, this art has not yet been much practised. Many of these properties belong to a much higher species of encaustic painting afterwards discovered in England, the colours of which are fixed by a very intense heat; nor are the colours or grounds on which they are laid liable to be dissolved or corroded by any chemical menstruum; nor, like the glassy colours of enamel, to run out of the drawing on the fire. This method is described in the second part of the xlixth volume of the Philosophical Transactions, N° 100. Yet, notwithstanding the ingenuity of this communication, we find the ancient or some similar method of painting in wax remained a desideratum upwards of twenty-five years; and till, in 1787, a method was communicated to the Society of Arts by Miss Greenland. The ground of her information she received at Florence, through the acquaintance of an amateur of painting, who procured her the satisfaction of seeing some paintings in the ancient Grecian style, executed by signora Parenti, a professor at that place, who had been instructed by a jesuit at Pavia, the person who made the farthest discoveries in that art. Miss Greenland's friends, knowing she was fond of painting, informed her what were the materials the paintress used, but could not tell her the proportions of the composition; however, from her anxiety to succeed in such an acquisition, she made various experiments, and at last obtained such a sufficient knowledge of the quantities of the different ingredients as to begin and finish a picture, which she afterwards presented to the society for their inspection.

Her method is as follows: "Take an ounce of white wax, and the same weight of gum mastich powdered. Put the wax in a glazed earthen vessel over a very slow fire; and when it is quite dissolved, strew in the mastich, a little at a time, stirring the wax continually until the whole quantity of gum is perfectly melted and incorporated: then throw the paste into cold water; and when it is hard, take it out of the water, wipe it dry, and beat it in one of Mr. Wedgwood's mortars, observing to pound it at first in a linen cloth to absorb some drops of water that will remain in the paste, and would prevent the possibility of reducing it to a powder, which must be so fine as to pass through a thick gauze. It should be pounded in a cold place, and but a little while at a time, as after long beating the friction will in[illegible] soften the wax and gum, and instead of their becoming a powder they will return to a paste.

"Make strong gum arabic water, and when you paint, take a little of the powder, some colour, and mix them together with the gum water. Light colours require but a small quantity of the powder, but more of it must be put in proportion to the body and darkness of the colours; and to black there should be almost as much of the powder as colour.

"Having mixed the colours, and no more than can be used before they grow dry, paint with fair water, as is practised in painting with water colours, a ground on the wood being first painted of some proper colour prepared in the same manner as is described for the picture; walnut-tree and oak are the sorts of wood commonly made use of in Italy for this purpose. The painting should be very highly finished; otherwise, when varnished, the tints will not appear united.

"When the painting is quite dry, with rather a hard brush, passing it one way, varnish it with white wax, which is put into an earthen vessel, and kept melted over a very slow fire till the picture is varnished, taking great care that the w[illegible] does not boil. Afterwards hold the picture bef[illegible] a fire, near enough to melt the [illegible] make it run; and when the varnish is entirely cold and hard, rub it gently with a linen cloth. Should the varnish blister, warm the picture again very slowly, and the bubbles will subside. When the picture is dirty, it need only be washed with cold water."

The opinion given by the society upon the above is, The method made use of by Miss Greenland provides against all inconveniencies; and the brilliancy of the colours in the picture painted by her, and exhibited to the society, fully justifies the opinion, that the art of painting in wax, as above described, highly merited the reward of a gold pallet voted to her on this occasion.

Another lady, Mrs. C J. Hooker, of Rottingdean near Brighton, laid before the Society of Arts, in 1807, the following method of preparing and applying a composition for painting in imitation of the ancient encaustic painting.

"Put into a glazed earthen vessel four ounces and a half of gum arabic, and eight ounces (or half a pint wine measure) of cold spring water; when the gum is dissolved, stir in seven ounces of gum-mastich, which has been washed, dried, picked, and beaten fine. Set the earthen vessel containing the gum-water, and gum-mastich, over a slow fire, continually stirring and beating them hard with a spoon, in order to dissolve the gum-mastich: when sufficiently boiled, it will no longer appear transparent, but will become opaque, and stiff, like a paste. As soon as this is the case, and that the gum-water and mastich are quite boiling, without taking them off the fire, add five ounces of white wax, broken into small pieces, stirring and beating the different ingredients together, till the wax is perfectly melted and has boiled. Then take the composition off the fire, as boiling it longer than necessary would only harden the wax, and prevent its mixing so well afterwards with water. When the composition is taken off the fire, and in the glazed earthen vessel, it should be beaten hard, and whilst hot (but not boiling) mix with it by degrees a pint (wine measure) or sixteen ounces more of cold spring water, then strain the composition, as some dirt will boil out of the gum-mastich, and put it into bottles: the composition, if properly made, should be like a cream, and the colours when mixed with it as smooth as with oil. The method of using it is to mix with the composition, upon an earthen palette, such colours in powder as are used in painting with oil, and such a quantity of the composition to be mixed with the colours as to render them of the usual consistency of oil colours; then paint with fair water. The colours when mixed with the composition may be laid on either thick or thin, as may best suit your subject, on which account, this composition is very advantageous, where any particular transparency of colouring is required; but in most cases it answers best, if the colours be laid on thick, and they require the same use of the brush as if painting with body colours, and the same brushes as used in oil painting. The colours, if grown dry, when mixed with the composition, may be used by putting a little fair water over them; but it is less trouble to put some water when the colours are observed to be growing dry. In painting with this composition the colours blend without difficulty when wet, and even when dry the tints may easily be united by means of a brush and a very small quantity of [illegible] water. When the painting is finished, put [illegible] white wax into a glazed earthen vessel over a slow fire, and when melted, but not boiling, with a hard brush cover the painting with the wax; and when cold take a moderately hot iron, such as is used for ironing linen, and so cold as not to hiss, if touched with any thing wet, and draw it lightly over the wax. The painting will appear as if under a cloud till the wax is perfectly cold, as also whatever the picture is painted upon is quite cold: but if, when so, the painting should not appear sufficiently clear, it may be held before the fire, so far from it as to melt the wax but slowly; or the wax may be melted by holding a hot poker at such a distance as to melt it gently, especially such parts of the picture as should not appear sufficiently transparent or brilliant; for the oftener heat is applied to the picture, the greater will be the transparency and brilliancy of colouring; but the contrary effect would be produced if too sudden or too great a degree of heat was applied, or for too long a time, as it would draw the wax too much to the surface, and might likewise crack the paint. Should the coat of wax put over the painting when finished appear in any part uneven, it may be remedied by drawing a moderately hot iron over it again as before mentioned, or even by scraping the wax with a knife: and should the wax by too great or too long an application of heat form into bubbles at particular places, by applying a poker heated, or even a tobacco-pipe made hot, the bubbles would subside; or such defects may be removed by drawing any thing hard over the wax, which would close any small cavities.

"When the picture is cold, rub it with a fine linen cloth. Paintings may be executed in this manner upon wood (having first pieces of wood let in behind, across the grain of the wood, to prevent its warping), canvas, card, or plaster of Paris. The plaster of Paris would require no other preparation than mixing some fine plaster of Paris in powder with cold water the thickness of a cream; then put it on a looking-glass, having first made a frame of bees-wax on the looking-glass the form and thickness you would wish the plaster of Paris to be of, and when dry take it off, and there will be a very smooth surface to paint upon. Wood and canvas are best covered with some gray tint mixed with the same composition of gum-arabic, gum-mastich, and wax, and of the same sort of colours as before mentioned, before the design is begun, in order to cover the grain of the wood or the threads of the canvas. Paintings may also be done in the same manner with only gum-water and gum-mastich, prepared the same way as the mastich and wax; but instead of putting seven ounces of mastich, and when boiling, adding five ounces of wax, mix twelve ounces of gum-mastich with the gum-water, prepared as mentioned in the first part of this receipt: before it is put on the fire, and when sufficiently boiled and beaten, and is a little cold, stir in by degrees twelve ounces, or three quarters of a pint (wine measure) of cold spring water, and afterwards strain it. It would be equally practicable painting with wax alone, dissolved in gum-water in the following manner. Take twelve ounces, or three quarters of a pint, wine measure, of cold spring water, and four ounces and a half of gum-arabic; put them into a glazed earthen vessel, and when the gum is dissolved, add eight ounces of white wax. Put the earthen vessel with the gum-water and wax upon a slow fire, and stir them till the wax is dissolved and has boiled a few minutes;

then take them off the fire and throw them into a bason, as by remaining in the hot earthen vessel the wax would become rather hard; beat the gum-water and wax till quite cold. As there is but a small proportion of water in comparison to the quantity of gum and wax, it would be necessary in mixing this composition with the colours, to put also some fair water. Should the composition be so made as to occasion the ingredients to separate in the bottle, it will become equally serviceable if shaken before used to mix with the colours.

"I had lately an opportunity of discovering that the composition which had remained in a bottle since the year 1792, in which time it had grown dry and become as solid a substance as wax, returned to a cream-like consistence, and became again in as proper a state to mix with colours as when it was first made, by putting a little cold water upon it, and suffering it to remain on a short time. I also lately found some of the mixture composed of only gum-arabic water and gum-mastich, of which I sent a specimen to the Society of Arts in 1792; it was become dry, and had much the appearance and consistency of horn. I found, on letting some cold water remain over it, that it became as fit for painting with as when the composition was first prepared."

ENCEINTE, in fortification, the wall or rampart which surrounds a place, sometimes composed of bastions or curtains, either faced or lined with brick or stone, or only made of earth. The enceinte is sometimes only flanked by round or square towers, which is called Roman wall.

ENCEPHALI. An obsolete term in medicine, to signify worms supposed to have been generated in the brain, causing great pain and distraction. The old writers state these worms or larves to have been very rare, but to have swarmed in some diseases, and to have produced pestilential fevers. Upon the dissection of one who died of this fever, a little, short, red worm was pretended to have been found in the head, which Malmsey wine, wherein horse-radish had been boiled, could only destroy. This medicine was afterwards tried on the sick, most of whom we are told it cured.

The like worms have also we are told been taken out by trepanning, and the patient cured. Those worms that generate in the nose, ears, and teeth, are also called encephali. The whole assertion is now justly exploded.

ENCEPHALON, (*encephalon*, εγκεφαλον; from εν, in, and κεφαλη, the head.) Encephalum. By some writers the cerebrum only is so called; while others express by this term the whole contents of the cranium.

To ENCHA'FE. *v. a.* (*eschauffer*, French.) To enrage; to irritate; to provoke (*Shak.*).

To ENCHA'IN. *v. a.* (*enchainer*, French.) 1. To fasten with a chain; to hold in chains; to bind; to hold in bondage (*Dryden*). 2. To link together; to concatenate (*Howel*).

To ENCHA'NT. *v. a.* (*enchanter*, Fr.) 1. To give efficacy to any thing by songs of sorcery (*Granville*). 2. To subdue by charms or spells (*Sidney*). 3. To delight in a high degree (*Pope*).

ENCHA'NTER. *s.* (*enchanteur*, French.) A magician; a sorcerer (*D. of Piety*).

ENCHA'NTINGLY. *ad.* (from *enchant.*) With the force of enchantment (*Shakspeare*).

ENCHA'NTMENT. *s.* (*enchantement*, Fr.) 1. Magical charms; spells; incantation (*Knolles*). 2. Irresistible influence; overpowering delight (*Pope*).

ENCHA'NTRESS. *s.* (*enchanteresse*, Fr.) 1. A sorceress; a woman versed in magical arts (*Tatler*). 2. A woman whose beauty or excellencies give irresistible influence (*Thomson*).

To ENCHA'SE. *v. a.* (*enchasser*, French.) 1. To infix; to inclose in any body so as to be held fast, but not concealed (*Felton*). 2. To adorn by being fixed upon it (*Dryden*). 3. To adorn by raised work (*Ben Jonson*).

ENCHASING, INCHASING, or CHASING, the art of enriching and beautifying gold, silver, and other metal-work, by some figures represented thereon, in low relievo.

Enchasing is practised only on hollow thin works, as watch-cases, cane-heads, tweezer-cases, &c. It is performed by punching or driving out the metal, to form the figure from within-side, so as to stand out prominent from the plane or surface of the metal. In order to do this, they provide a number of fine steel-blocks, or puncheons, of divers sizes; and the design being drawn on the surface of the metal, they apply the inside upon the heads or tops of these blocks, directly under the lines or parts of the figures; then, with a fine hammer striking on the metal, sustained by the block, the metal yields, and the block makes an indenture, or cavity, on the inside, corresponding to which there is a prominence on the outside, which is to stand for that part of the figure.

Thus the workman proceeds to chase and finish all the parts by successive application of the block and hammer to the several parts of the design; and it is surprising to consider with what beauty and justness, by this simple piece of mechanism, the artists in this kind will represent foliages, grotesques, animals, histories, &c.

ENCHE'ASON. *s.* (*encheson*, old law Fr.) Cause; occasion (*Spenser*).

ENCHELIS. In zoology, a genus of the class vermes, order infusoria. Worm invisible to the naked eye, very simple, cylindrical. Fifteen species; generally found in stagnant water, putrid water, or that has been kept several days, and in marshes: yet two or three in dunghills; and one, e. fusus, in pure water, with a cylindrical body, narrower and truncate at both extremities, slow in motion, with a longitudinal slightly-curved intestine, filled with a bluish fluid and blackish molecules.

ENCHORIC. ENCHORIOUS. (εγχωριος, from εν, in, and χωρος, a place.) Endemic: peculiar to a country.

To ENCI'RCLE. *v. a* (from *circle.*) To surround; to environ; to enclose in a ring (*Pope*).

ENCI'RCLET. *s.* (from *circle.*) A circle; a ring (*Sidney*).

ENCLITICA, of εγκλινω, I incline, in Greek and Latin grammar, certain [illegible] united so closely to the [illegible] they only seem to form one word; while the word which sustains them generally likewise bear the accent that governs them, especially when the enclitic is a monosyllable; as in dominusque, κυριεςτε.

There are three enclitic particles in the Latin, viz. *que*, *ne*, and *ve*; but in the Greek many, as τε, μευ, μοι, μι, σευ, τοι, σι, πως, πη, τι, γε, φημι, ειμι, ποτε, and others.

To ENCLO'SE. *v. a* (*enclos*, French.) 1. To part from things or grounds common by a fence (*Hay*.). 2. To environ; to encircle; to surround; to encompass; to include (*Pope*).

ENCLO'SER. *s.* (from *enclose.*) 1. One that encloses or separates common fields into several distinct properties (*Herbert*). 2. Any thing in which another is enclosed.

ENCLO'SURE. *s.* (from *enclose.*) 1. The act of enclosing or environing any thing (*Wilkins*). 2. The separation of common grounds into distinct possessions (*Hayward*). 3. The appropriation of things common (*Taylor*). 4. State of being shut up in any place (*Burnet*). 5. The space enclosed (*Addison*). 6. Several; ground inclosed; ground separated from the common (*South*).

ENCLYSMA. (εγκλυσμα; from εν, and κλυζω, to cleanse out.) A clyster.

ENCO'MIAST *s.* (εγκωμιαςης.) A panegyrist; a proclaimer o fpraise: a praiser (*Locke*).

ENCOMIA'STICAL, ENCOMIA'STIC. *a.* (εγκωμιαςικος.) Panegyrical; laudatory; containing praise; bestowing praise.

ENCO'MIUM. *s.* (εγκωμιον.) Panegyrick; praise; elogy (*Gov. of the Tongue*).

To ENCO'MPASS. *v. a.* (from *compass.*) 1. To enclose; to encircle (*Shakspeare*). 2. To shut in; to surround; to environ (*Shakspeare*). 3. To go round any place.

ENCO'MPASSMENT. *s.* (from *encompass.*) Circumlocution; remote tendency of talk.

ENCO'RE. *ad.* (Fr.) Again; once more (*Pope*).

ENCO'UNTER. *s.* (*encontre*, French.) 1. Duel; single fight; conflict (*Dryden*). 2. Battle; fight in which enemies rush against each other (*Milton*). 3. Eager and warm conversation, either of love or anger (*Shakspeare*). 4. Accidental congress; sudden meeting (*Pope*). 5. Unexpected address (*Shakspeare*). 6. Casual incident; occasion (*Pope*).

To ENCO'UNTER. *v. a.* (from the noun.) 1. To meet face to face; to front (*Shakspeare*). 2. To meet in a hostile manner; to rush against in conflict (*Knolles*). 3. To meet with reciprocal kindness (*Shakspeare*). 4. To attack; to meet in the front (*Tillotson*). 5. To oppose; to oppugn (*Hale*). 6. To meet by accident (*Shakspeare*).

To ENCO'UNTER. *v. n.* 1. To rush together in a hostile manner; to conflict (*Shakspeare*). 2. To engage; to fight (*Knolles*). 3. To meet face to face. 4. To come together by [illegible]nce.

[illegible]NCO'UNTERER. *s.* (from *encounter.*) [illegible]; antagonist; enemy (*More*). 2. [illegible] other (*Shakspeare*).

To ENCO'URAGE. *v. a.* (*encourager*, Fr.) 1. To animate; to incite to any thing (*Psal.*). 2. To give courage to; to support the spirits; to embolden (*K. Charles*). 3. To raise confidence; to make confident (*Locke*).

ENCO'URAGEMENT. *s.* (from *encourage.*) 1. Incitement to any action or practice. 2. Increase of confidence (*Philips*). 3. Favour; countenance; support (*Otway*).

ENCOU'RAGER. *s.* (from *encourage.*) One that supplies incitements to any thing; a favourer (*Dryden*).

ENCRA'NIUM. (εγκρανιον; from εν, within, and κρανιον, the scull.) The cerebellum: the whole contents of the scull.

ENCRATITES, or CONTINENTES, in church-history, a sect of Christians who appeared towards the end of the second century, and gloried in abstaining from marriage and the use of wine.

ENCRINITE. ENCRINUS. In oryctology. See HELMINTHOLITHUS.

To ENCRO'ACH. *v. a.* (*accrocher*, from *croc*, a hook, French.) 1. To make invasions upon the right of another; to put a hook into another man's possessions to draw them away (*Spenser*). 2. To advance gradually and by stealth upon that to which one has no right (*Herbert*).

To ENCRO'ACH. *v. n.* 1. To creep on gradually without right (*Hooker*). 2. To pass bounds (*Milton*).

ENCRO'ACHER. *s.* (from *encroach.*) 1. One who seizes the possession of another by gradual and silent means (*Swift*). 2. One who makes slow and gradual advances beyond his rights (*Clarissa*).

ENCRO'ACHMENT. *s.* (from *encroach.*) 1. An unlawful gathering in upon another man (*Cowell. Milton*). 2. Advance into the territories or rights of another (*Addison*).

To ENCU'MBER. *v. a.* (*encombre*, Fr.) 1. To clog; to load; to impede (*Hooker*). 2. To entangle; to embarrass (*Dryden*). 3. To load with debts.

ENCU'MBRANCE. *s.* (from *encumber*) 1 Clog; load; impediment (*Temple*). 2. Excrescence; useless addition (*Thomson*). 3. Burden upon an estate (*Ayliffe*).

ENCY'CLICAL. *a.* (εγκυκλιος.) Circular; sent round through a large region (*Stilling*.).

ENCYCLOPÆDIA, a term nearly synonymous with cyclopædia, but adopted in preference to it by most editors of general dictionaries. According to the late learned printer, Mr. Bowyer, the preposition EN makes the meaning of the word more precise. For *cyclopædia* may denote the instruction OF a circle, and to make the sense complete must imply the expression *in the form*; i. e. "knowledge in the form of a circle." Whereas in EN*cyclopædia*, the preposition determines the word to be from the dative of *cyclus*, instruction IN a circle. And Vossius, in his book, De vitiis sermonis, has observed, that *cyclopædia* is used by some authors, but *encylopædia* by the best.

The following concise but interesting his-story of general dictionaries we extract from a contemporary periodical publication.

A dictionary, in its original sense, is a collection of words arranged alphabetically, to assist the researches of those who are studying a new language, or to explain the mythology, customs, geography, and biography, of those to whom that language is common. This is all that was aimed at by Hesychius and by Suidas, in their respective lexicons; the former of which was composed about the end probably of the fourth century, and first printed at Venice in 1514; the latter, it is commonly supposed, was written in the twelfth century, and was printed at Milan, as early as 1499. In 1573 a dictionary of science appeared under this title, Λεξικον, seu Dictionarium mathematicorum, in quo definitiones et divisiones continentur scientiarum mathematicarum arithmeticæ, &c. M. Conrado Dasypodio, authore: a very remarkable book for the time in which it was published, and of which a new edition appeared at Strasburg in 1579. The two Stephani compiled dictionaries of words only; a class of publications, which naturally abounded, soon after the revival of letters, and especially in the 16th century. The Medical Dictionary of H. Stephanus is confined to the explanation of the language of Hippocrates and Galen. Cooper's Latin Thesaurus was published in 1587. The first work we have seen under the title of Encyclopædia, is J. H. Alstedii Encyclopædia, which was published in 1632, in 2 vols. folio: an elaborate performance, which was followed in 1657, by Erhardi Weigelii Idea Encyclopædiæ Mathematico-philosophicæ, a work not superlatively interesting, even for that period. Hoffman, whose Lexicon Universale Historicum Sacrum et Profanum, was published in four folio volumes, at Basle, in 1677, chiefly expanded the geography, mythology, and ancient history of the Jews, Greeks and Romans, from the Dictionary of Lloyd, published in 1659. We need not dwell on the Lexicon of Pitiscus, of Du Cange and Charpentier, of d'Herbelot, nor upon the Dictionnaire Mathematique of Ozanam, nor the Thesaurus of Hickes. The next important step was made by Dr Harris, in his Lexicum Technicum, published, the first volume in 1704, the second in 1710. This is the earliest English work, which assumes to good purpose the systematic form of a General Dictionary, and attempts to allot to each article its comparative portion in the scale of human knowledge. It is, altogether, a very valuable performance; and may even now be advantageously consulted, on various topics which have been neglected by later lexicographers. The author possessed very considerable general knowledge; but his attainments as a mathematician and philosopher were most conspicuous. His judicious labours much facilitated the progress of all who followed in the same department, for the next half century; though, with a mean reserve of which most of them are guilty, they seldom venture to acknowledge their obligations to him. It is indeed truly extraordinary, that Dr. Harris's name does not occur either in Bayle, in the General Dictionary, in the Biographia Britannica, nor even in the Mathematical and Philosophical Dictionary of Hutton; though he was much too far removed from the authors of the two last publications, to leave any room for the operation of jealousy. To the fifth edition of Harris's Lexicon, in 1736, a supplement was added: the aim of its compilers was rather to supply the omissions in other branches of science than in mathematics and philosophy, which had made, however, an immense progress from 1704 to that time.

Various Dictionaries were published between Harris's Lexicon, and the Cyclopædia of Chambers: such, for example, as the Great Dictionary of the French academy, the Dictionary of the Jesuits of Trevoux, the Chemical Dictionary of Johnson, the Medical ones of Blanchard, and Castellus, the Mathematical Dictionaries of Stone and Wolfius, the Sea Dictionary of Mainwaring, the Dictionary of the Bible by Calmet, the Lexicon Philosophicum of Chauvin, the Lexicon of J. Burkard Menkens, published at Leipsic in 1715, Jablonski's Lexicon, in 1721, and Collier's Great Historical Dictionary, begun in 1694 and finished in 1727. Chauvin's Lexicon is, indeed, a work of importance. It contains some very correct diagrams, and a good illustration of philosophy, so far as the ancients were acquainted with it. The view of the mathematical science of the ancients, which it exhibits, is very interesting. It is sadly contaminated with the jargon of the schools; and those parts of it, which are in this respect objectionable, have been transcribed by later writers with a most disgraceful servility.

The first edition of Chambers's Cyclopædia made its appearance in folio, in 1727. Such was the excellence of its plan, and the general correctness of its execution, that the public demand occasioned a second edition to be published in 1738, a third in 1739, a fourth in 1741, and a fifth in 1746. This unprecedented success induced the proprietors to engage Mr. G. L. Scott and Dr. Hill to prepare a Supplement to the sixth edition, which was accordingly published in two additional volumes. The seventh edition, completed in 1786 in four thick folio volumes, removed the disadvantage of the double alphabets, by incorporating them into one The editor of this edition was Dr. Abraham Rees, a gentleman every way qualified for the task he had undertaken; and who, with the assistance of Dr. Price, and other eminent men, rendered this work by far the most useful of the kind which had been published, the pride of booksellers, and an honour to the literature and science of this country. We must not omit to mention, that Mr. Chambers himself [illegible] much more than a mere compiler: he w[illegible] man of very considerable [illegible] taste, and of vigorous intellect. We consider the preface to his Dictionary as one of the finest specimens of sound reasoning and comprehensive thinking which have ever appeared in any language.

From this period, dictionaries devoted to arts and sciences, as well as general dictionaries, comprizing the whole circle of arts and sciences, have increased very rapidly both in number and importance. Though we shall not attempt to embody the shadows of a shade, or to swell this account into a catalogue, yet we cannot forbear mentioning the Medical Dictionaries of Motherby, Quincy, James, Turton, and the Edinburgh Dictionary; the Chemical Dictionaries of Macquer, Nicholson, and the Aikins; the Dictionaries of Gusseme and Rasches, on Numismatology; those of Miller, Martyn, and Dickson, on Gardening; those of Burn, Cunningham, and Jacob, since edited by Tomlins, on Law; the Marine Dictionaries of Chapman and Falconer; the Builder's Magazine, and Felibien's Dictionary of Architecture; Jombert's Dictionnaire de l'Engenieur et de l'Artilleur, and James's Military Dictionary; Pilkington's Dictionary of Painters; Mortimer's and Postlethwaite's Dictionaries of Trade and Commerce; Rousseau's, Hoyle's, and Busby's Dictionaries of Music; the Mathematical and Philosophical Dictionary of Dr. Hutton, and the Dictionnaire de Physique of M. Libes. The diligence exerted by the authors of these and a few other dictionaries appropriated to separate branches of science, and by the editors of encyclopædias, has operated reciprocally to improve both; and hence it has happened, that many both of particular and general dictionaries, published during the last fifty years, have greatly contributed to the improvement and diffusion of human knowledge.

The labours of the continental encyclopædists, during this period, have been too important to be omitted in this survey. Among the works of the Germans, we may specify the Universal Lexicon of Ludwig, published in 1732—1750, in 64 volumes; the Œkonomische Encyclopädie, by Krünitz, in 1773; the Encyclopädia der Historischen, Philosophiscen, und Mathematischen Wissenchaften, by Büsch, in 1775, and 1795; Klügel's Encyclopädie, in 1782 and 1784; and the Encyclopädie aller Mathematischen Wissenschaften, ihrer Geschichte und Litteratur, by Rosenthal, in 1790. To these may be added, the Swedish Encyclopædia, published at Stockholm, by Giorwell, in 1785; and the Enciclopedia Italiana ovvero Bibliotheca universale della umane cognizioni, published at Naples in 1788.

Our neighbours the French, also, have the Dictionnaire universel de Mathematiques et de Physique, by M. Savérien, in 1753; the Encyclopedie, ou Dictionnaire raisonné des Sciences, des Arts, et des Metiers, by Diderot, D'Alembert, &c. in 1751—1757; the Dictionnaire Portatif, in 1760; the Dictionnaire [illegible]if, in 1763; the new edition of the Encyclopedie, by Diderot, &c. in 39 volumes, in 1778—1779; and the Encyclopedie Methodique, by D'Alembert, Bossut, Condorcet, Lalande, &c. which commenced in 1785, and consists of separate alphabets or dictionaries for the respective arts and sciences. Of the two last and most celebrated of these works, it is almost unnecessary for us to say, that their authors made them the vehicles of artful, insidious attacks upon revealed religion, and established governments. But, alas! these generous and enlightened philanthropists, who laboured so diligently for the perfection of the human species by trying to persuade them that they were not superior, either in essential nature, or ultimate destiny, to dogs or sheep, were persecuted!—for so we are told by one of the fraternity. Diderot, it seems, hoped—" à travers une multitude inevitable d'articles insignificans, faire passer quelques traits utiles aux progrés de la raison, qui seraient facilemente démêlés par les esprits préparés pour les saisir, et qui échapperaient aux regards de la sottise. Son espérance ne fut pas réalisée: la sottise a, pour la défense de son empire, les yeux beaucoup plus perçans qu'on ne croit, et sut prévoir le coup que la philosophie allait lui porter. La persécution commença des lors contre les philosophes, qui reçurent le nom d'Encyclopédistes; et la persécution compte sur un succés, quand elle a trouvé un nom pour designer ses victimes." (*Lacroix sur L'Enseign*).

We must now glance rapidly at the labours of British encyclopædists since the time of Chambers; passing over the productions of Owen, Proctor, Castieau, Hall, Howard, and Kendal, with a mere notice of their names; the only one of which that we do not feel desirous to forget is Owen. We must however mention, with commendation, the Dictionary of Arts and Sciences published in 1766, by Crowder, in 3 vols. 4to. The editors were, Rev. J. Scott, Trinity College, Cambridge; Mr. Charles Green, of the royal observatory, Greenwich; Mr. James Meader; and Falconer, the unfortunate author of the Shipwreck. This, a truly respectable performance, both as to substance and appearance; the plates are well executed; and those, especially, on which the signs of the zodiac are delineated, are superior to any we have seen in a Dictionary.

The work just mentioned, however, is far inferior to Chambers, who has hitherto had no such formidable rival in Britain as the Encyclopædia Britannica, published at Edinburgh, first we believe in 1768, in 10 vols. 4to. This was also, as far as we have been able to learn, the earliest work that attempted the innovation of incorporating systems or treatises with the usual articles in the alphabetical arrangement. The third edition of this encyclopædia, superintended by Dr. Gleig, was finished in 1800; the whole, including a Supplement of 2 vols., being comprized in twenty quarto volumes. It contains, beside the general matters treated in Chambers's Dictionary, the additional subjects of biography, history, and geography. It is a publication, in many respects, of considerable excellence. It commonly explains the principles and practices in the various sciences and arts with great perspicuity and correctness. Its theology is generally sound; and its politics apparently the result of honest conviction, though often delivered in the intemperate tone which marked most political disquisitions ten years ago. Many of the treatises it contains were drawn up by some of the most eminent Scotch professors; those especially which were written by the late Dr. Robison, though composed in the desultory manner which characterises all the productions of that distinguished philosopher, stamp a particular value upon the work in which they are found, and render it decidedly superior in all points connected with the physical sciences to any other encyclopædia yet published in Britain. We are sorry to add, that the style of the engravings, which is truly execrable, puts it completely out of our power to say that this dictionary is elegant as well as useful.

The English Encyclopædia was completed in 10 vols. 4to. in 1803. The names of its conductors are not mentioned; but they are commonly understood to have been Dr. Aikin and Mr. Houlston. Its general plan is much like that of the Encyclopædia Britannica; but its execution no where superior, except in the engraving, and the departments of biography and geography. The readers of this publication, however, will not be disgusted with tedious descriptions of obscure towns and villages, with minute histories of fabulous heroes and divinities, or with tiresome and uninteresting biography. The plates possess a striking superiority over those of any preceding encyclopædia. (*Eclectic Review*).

Such is the general diffusion of knowledge in this country, and so prevalent is the desire to possess a library in one work, that beside two General Dictionaries just finished, no less than six others are now in course of publication, viz. The Encyclopædia Londinensis, a new edition of the Encyclopædia Perthensis, Brewster's Edinburgh Encyclopædia, our own work the Pantologia, a new edition of the Encyclopædia Britannica, and Dr. Rees's New Cyclopædia. Of the comparative merits of these works it would not become us to speak: we are not writing as reviewers but as historians.

ENCY'STED. *a.* (κυςις.) Enclosed in a vesicle or bag (*Sharp*).

END. *s.* (enꝺ, Saxon.) 1. The extremity of the length of any thing materially extended (*Locke*). 2. Extremity or last part in general (*Locke*). 3. The last particle of any assignable duration (*Donne*). 4. The conclusion or cessation of any action (*Genesis*). 5. Ultimate state; final doom (*Psalms*). 6. The point beyond which no progression can be made (*Psalms*). 7. Final determination; conclusion of debate or deliberation (*Shakspeare*). 8. Death; fate; decease (*Roscommon*). 9. Cessation; period (*Matthew*). 10. Limit; termination (*Nahum*). 11. Abolition; total loss (*Locke*). 12. Cause of death; destroyer (*Shakspeare*). 13. Consequence; conclusive event (*Shakspeare*). 14. Fragment; broken piece (*Shakspeare*). 15. Purpose; intention (*Clarendon*). 16. Thing intended; final design (*Suckling*). 17. *An* END. Upright; erect: as, his hair stands *an end*.

To END. *v. a.* (from the noun.) 1. To terminate; to conclude; to finish. 2. To destroy; to put to death (*Shakspeare*).

To END. *v. n.* 1. To come to an end; to be finished (*Fairfax*). 2. To terminate; to conclude (*Taylor*). 3. To cease; to fail (*Locke*).

END-NICKED, in botany. See EMARGINATE.

To ENDA'MAGE. *v. a.* (from *damage*.) To mischief; to prejudice; to harm (*South*).

To ENDA'NGER. *v. a.* (from *danger*.) 1. To put into hazard; to bring into peril (*Til.*). 2. To incur the danger of; to hazard (*Bacon*).

To ENDE'AR. *v. a.* (from *dear*.) To make dear; to make beloved (*Wake*).

ENDE'ARMENT. *s.* (from *endear*.) 1. The cause of love; means by which any thing is endeared (*Thomson*). 2. The state of being endeared; the state of being loved (*South*).

ENDE'AVOUR. *s.* (*devoir, endevoir*, Fr.) Labour directed to some certain end (*Till.*).

ENDEAVOUR STRAIT, a strait of the S. Pacific Ocean, which separates New Guinea from New Holland.

To ENDE'AVOUR. *v. n.* (from the noun.) To labour to a certain purpose (*Pope*).

To ENDE'AVOUR. *v. a.* To attempt; to essay (*Milton*).

ENDE'AVOURER. *s.* (from *endeavour*.) One who labours to a certain end (*Rymer*).

ENDE'CAGON. *s.* (ενδεκαγον.) A plain figure of eleven sides and angles.

ENDEMIC. (*endemicus*, ενδημικος; from εν, in, and δημος, people.) A disease so termed that is peculiar to a certain class of persons, or country: thus struma is endemial to the inhabitants of Derbyshire and the Alps; scurvy to seafaring people; and the plica polonica is only to be met with in Poland.

To ENDE'NIZE. *v. a.* (from *denizen*.) To make free; to enfranchise (*Camden*).

To ENDI'CT. *To* ENDI'TE. *v. a.* (*enditer*, French.) 1. To charge any man by a written accusation before a court of justice: as *he was* endited *for felony*. 2. To draw up; to compose; to write (*Gay*).

To ENDI'TE. *v. n.* To compose (*Waller*).

ENDI'CTMENT. ENDI'TEMENT. *s* (from *endite*.) A bill or declaration made in form of law, for the benefit of the commonwealth (*Hooker*).

ENDIVE, or ENDIVIA, in botany. See CICHORUM.

E'NDLESS. *a.* (from *end.*) 1. Having no end; being without conclusion or termination (*Pope*). 2. Infinite in longitudinal extent

(*Tillotson*). 3. Infinite in duration; perpetual (*Hooker*). 4. Incessant; continual (*Pope*).

Endless rolls and screw. See the substantives.

E'NDLESSLY. *ad.* (from *endless.*) 1. Incessantly; perpetually (*Decay of Piety*). 2. Without termination of length.

E'NDLESSNESS. *s.* (from *endless.*) 1. Extension without limit. 2. Perpetuity; endless duration. 3. The quality of being round without an end (*Donne*).

E'NDLONG. *ad.* (*end* and *long.*) In a straight line (*Dryden*).

E'NDMOST. *a.* (*end* and *most.*) Remotest; furthest; at the further end.

ENDOR, in ancient geography, a town of Galilee, four miles to the south of Mount Tabor, in the tribe of Manasseh. This is the place where the Pythoness was consulted by Saul. It is at this day a large village.

To ENDO'RSE. *v. a.* (*endorser*, French.) 1. To register on the back of a writing; to superscribe. 2. To cover on the back: not used.

ENDORSEMENT, of *in* and *dorsum*, *back*, is particularly used in commerce, for a writing on the back of a bill of exchange by the proprietor or bearer, either thereby to transfer it to some other, or to render it payable to the order of some other, or else to serve for an acquittance or receipt.

To ENDO'W. *v. a.* (*indotare*, Latin.) 1. To enrich with a portion (*Exodus*). 2. To supply with any external goods (*Addison*). 3. To enrich with any excellence (*Swift*). 4. To be the fortune of any one (*Shakspeare*).

ENDO'WMENT. *s.* (from *endow.*) 1. Wealth bestowed to any person or use. 2. The bestowing or assuring a dower (*Cowley*). 3. Appropriation of revenue (*Dryden*). 4. Gifts of nature (*Addison*).

Endowment, in law, denotes the settling a dower on a woman: though sometimes it is used figuratively, for settling a provision upon a parson, on the building of a church; or the severing a sufficient portion of tithes for a vicar, when the benefice is appropriated.

To ENDU'E. *v. a.* (*induo*, Latin.) To supply with mental excellencies (*Common Pray.*).

ENDU'RANCE. *s.* (from *endure.*) 1. Continuance; lastingness (*Spenser*). 2. Patience; sufferance (*Temple*). 3. State of suffering (*South*). 4. Delay; procrastination: obsolete (*Shakspeare*).

To ENDU'RE. *v. a.* (*endurer*, French.) 1. To bear; to sustain; to support (*Bacon*). 2. To bear with patience (*Milton*). 3. To undergo; to sustain (*Dryden*).

To Endu're. *v. n.* 1. To last; to remain; to continue (*Locke*). 2. To brook; to bear; to admit (*Davies*).

ENDU'RER. *s.* (from *endure.*) 1. One that can bear or endure; sustainer; sufferer (*Spenser*). 2. Continuer; laster.

ENDWISE. *ad.* (*end* and *wise.*) Erectly; uprightly; on end (*Ray*).

ENDYMION, in fabulous history, a shepherd, son of Æthlius and Calyce. It is said that he required of Jupiter to grant to him to be always young, and to sleep as much as he would; whence came the proverb of *Endymionis somnum dormire*, to express a long sleep. Diana saw him naked as he slept on mount Latmos; and was so struck with his beauty, that she came down from heaven every night to enjoy his company. Endymion married Chromia daughter of Itonus; by whom he had three sons, Pæon, Epeus, and Æolus, and a daughter called Eurydice. The fable of Endymion's amours with Diana, or the moon, arose from his knowledge of astronomy; whence as he passed the night on some high mountain to observe the heavenly bodies, it came to be reported that he was courted by the moon. Some suppose that there were two of this name; the son of a king of Elis, and the shepherd or astronomer of Caria. The people of Heraclea maintained that Endymion died on mount Latmos, and the Eleans pretended to show his tomb at Olympia in Peloponnesus.

To E'NECATE. *v. a.* (*eneco*, Latin.) To kill; to destroy (*Harvey*).

E'NEMA. (*enema*, ἔνεμα; from ἐνίημι, to inject.) Clyster. Injection.

E'NEMY. *s.* (*ennemi*, French.) 1. A public foe (*Davis*). 2. A private opponent; an antagonist (*Matthew*). 3. Any one who regards another with malevolence; not a friend (*Shakspeare*). 4. One that dislikes (*Prior*). 5. The fiend; the devil (*Common Prayer*).

ENERGE'TICK. *a.* (ἐνεργητικός.) 1. Forcible; active; vigorous (*Harvey*). 2. Operative; active; working (*Grew*).

E'NERGY. *s.* (ἐνέργεια.) 1. Power not exerted in action (*Bacon*). 2. Force; vigour; efficacy (*Smalridge*). 3. Faculty; operation (*Bentley*). 4. Strength of expression; force of signification; spirit; life (*Roscommon*).

To ENE'RVATE. *v. a.* (*enervo*, Latin.) To weaken; to deprive of force (*Bacon*).

ENERVA'TION. *s.* (from *enervate.*) 1. The act of weakening; emasculation. 2. The state of being weakened; effeminacy.

To ENE'RVE. *v. a.* (*enervo*, Latin.) To weaken; to break the force of; to crush (*Digby*).

To ENFA'MISH. *v. a.* (from *famish.*) To starve; to famish; to kill with hunger.

To ENFEE'BLE. *v. a.* (from *feeble.*) To weaken; to enervate (*Taylor*).

To ENFE'OFF. *v. a.* (*feoffamentum*, low Latin.) To invest with any dignities or possessions. A law term (*Hale*).

ENFE'OFFMENT. *s.* (from *enfeoff.*) 1. The act of enfeoffing. 2. The instrument or deed by which one is invested with possessions.

To ENFE'TTER. *v. a.* To bind in fetters; to enchain: not in use (*Shakspeare*)

ENFIELD, a town in Middlesex, with a market on Saturdays. It was once famous for an extensive royal chase, disforested in 1779. It is 10 miles N. of London.

Enfield (William), LL.D. an able dissenting minister, was born at Sudbury, in March, 1741. He was educated at Daventry academy, under Dr. Caleb Ashworth, and in 1763 was ordained minister of a congregation at Liverpool, where he married. While here he published two volumes of sermons, which met with a good reception. About 1770 he removed to Warrington, where he discharged the office of tutor in the academy established there for the instruction of dissenters; and at the same time performed the functions of a pastor to the dissenting congregation which assembled at that place. During the period of his residence here he composed some useful works, particularly, The Speaker, and the Sequel to it, both well known school books; and Institutes of Natural Philosophy, 4to., a clear and well-arranged compendium of the leading principles, theoretical and experimental, of the philosophical sciences. A new and improved edition of this work has been lately published. In 1785, two years after the dissolution of the Warrington academy, Dr Enfield received an invitation from the congregation at the Octagon Chapel, Norwich, which he accepted. In this city and its neighbourhood he resided during the remainder of his life Much of his leisure was occupied in preparing for the press an abridgment of Brucker's History of Philosophy; this task he completed in 1791, and the work appeared in 2 vols. 4to. Here the tenets of philosophy, and the lives of its professors, are depicted in a pleasing form, and with much clearness and elegance. The last two or three years of his life were employed, in conjunction with Dr. Aikin, and others, in compiling a General Biographical Dictionary; a work which, as far as we can judge from the volumes already published, bids fair to be one of the most complete on this subject in any language. Dr. Enfield died, after a short illness, on the 3d of November, 1797.

The doctor was not only an able but an amiable man his public writings have ensured him the character of an ingenious, perspicuous, and correct writer, though they exhibit not many traces of profound thinking, or original genius. His conduct as a father, a tutor, and a minister, was such as caused him to be beloved, admired, and imitated.

ENFILADE, a French term, signifying a series or continuation of several things, disposed, as it were, in the same thread or line; as an enfilade of rooms, of buildings, &c.

To Enfila'de. *a.* (from the noun.) To pierce in a right line.

To ENFI'RE. *v. a.* (from *fire.*) To fire; to set on fire; to kindle: obsolete (*Spenser*).

To ENFO'RCE. *v. a.* (*enforcir*, French.) 1. To give strength to: to strengthen. 2. To make or gain by force (*Spenser*). 3. To put in act by violence (*Shakspeare*). 4. To instigate; to provoke; to urge on (*Spenser*). 5. To urge with energy (*Clarendon*). 6. To compel; to constrain (*Davies*). 7. To press with a charge (*Shakspeare*).

To Enfo'rce. *v. n.* To prove; to evince; to show beyond contradiction (*Hooker*).

Enfo'rce. *s.* (from *force.*) Power, strength: not used (*Milton*).

ENFO'RCEDLY. *ad.* (from *enforce*.) By violence; not voluntarily; not spontaneously; not by choice (*Shakspeare*).

ENFO'RCEMENT. *ad.* (from *enforce.*) 1. An act of violence, compulsion; force offered (*Raleigh*). 2. Sanction; that which gives force to a law (*Locke*). 3. Motive of conviction; urgent evidence (*Hammond*). 4. Pressing exigence (*Shakspeare*).

ENFO'RCER. *s.* (from *enforce.*) Compeller; one who effects by violence (*Hammond*).

ENFO'ULDRED. *a* (from *foudre*, Fr.) Mixed with lightning: obsolete (*Spenser*).

To ENFRA'NCHISE. *v. a.* (from *franchise*) 1. To admit to the privileges of a freeman (*Davies*). 2. To set free from slavery (*Temple*). 3. To free or release from custody (*Shakspeare*). 4. To denizen; to endenizen (*Watts*).

ENFRANCHI'SEMENT. *s.* 1. Investiture of the privileges of a denizen (*Cowell*). 2. Release from prison or from slavery (*Shak.*)

ENFRO'ZEN. *part.* (from *frozen.*) Congealed with cold not used (*Spenser*).

To ENGA'GE. *v. a.* (*engager*, French.) 1. To make liable for a debt to a creditor (*Shakspeare*). 2. To impawn; to stake (*Hudibras*) 3. To enlist; to bring into a party (*Tillotson*). 4. To embark in an affair (*Digby*). 5. To unite; to attach; to make adherent (*Addison*). 6. To induce, to win by pleasing means; to gain (*Waller*). 7. To bind by any appointment or contract (*Atterbury*). 8. To seize by the attention. 9. To employ; to hold in business (*Dry*). 10 To encounter, to fight (*Pope*).

To Enga'ge. *v. n* 1 To conflict; to fight (*Clarendon*). 2. To embark in any business, to inlist in any party (*Dryden*).

ENGA'GEMENT. *s.* (*engagement*, Fr.) 1. The act of engaging, impawning, or making liable to a debt. 2. Obligation by contract (*Atterbury*). 3. Adherence to a party, or cause; partiality (*Swift*). 4. Employment of the attention (*Rogers*). 5. Fight; conflict; battle (*Dryden*). 6. Obligation; motive (*Hammond*).

To ENGA'OL. *v. a.* (from *gaol.*) To imprison; to confine (*Shakspeare*).

To ENGA'RRISON. *v a.* (from *garrison*). To protect by a garrison (*Howel*).

ENGASTRIMYTHI. (εγγαστριμυθι, literally, *ventriloquists.*) In pagan theology, the Pythians, priests or priestesses of Apollo, who delivered oracles from within, without any action of the mouth or lips. The ancient philosophers, &c. are divided upon the power pretended to by the engastrimythi. Hippocrates mentions it as a disease; others will have it a kind of divination; others attribute it to the possession of an evil spirit; and others to art and mechanism. M. Scottus maintains, that the engastrimythi of the ancients were poets, who, when the priests could not speak, supplied the defe[illegible] explaining in verse what Apollo dictat[illegible] the cavity of the bas[illegible] sacred tripod.

ENGELBRECHTSEN (Cornelius), a celebrated painter, born at Leyden in 1468, and was the first who painted in oil in that country. Several noble pictures by this artist are still preserved in the churches of Leyden and Utrecht. He died in 1533.

To ENGE'NDER. *v. a.* (*engendrer*, Fr.) 1. To beget between different sexes (*Sidney*). 2. To produce; to form (*Davies*). 3. To excite; to cause; to produce (*Addison*). 4. To bring forth (*Prior*).

To ENGE'NDER. *v. n.* To be caused; to be produced (*Dryden*).

ENGERS, a town in the circle of the Lower Rhine, Germany. Lat. 50. 35 N. Lon. 7. 32 E.

ENGHELRAMS (Cornelius), an eminent painter in water colours, born at Malines in 1527. His chief works are in the church of St. Rombont, where he has represented the works of mercy. Several of his paintings are scattered throughout Germany, but they are all of the religious kind. He died in 1583.

ENGHIEN, a town of Hainault, in the Netherlands, famous for a battle which was fought near it in 1692, between the French and English troops, in which the former gained the victory. This is generally called the battle of Steinkirk. It is 15 miles N. of Mons. Lat. 50. 42 N. Lon. 4. 5 E.

ENGIA, ENGINA, or OEGINA, an island of European Turkey, lying on a gulph of the same name, between Livadia and the Morea. It is 22 miles S. of Athens. Lat. 37. 45 N. Lon. 23. 59 E.

E'NGINE. *s.* (*engin*, French.) 1. Any mechanical complication, in which various movements and parts concur to one effect. 2. A military machine (*Fairfax*). 3. Any instrument (*Raleigh*). 4. Any instrument to throw water upon burning houses (*Dryden*). 5. Any means used to bring to pass, or to effect (*Duppa*). 6. An agent for another (*Daniel*).

ENGINE, in mechanics, a compound machine, made of one or more mechanical powers, as levers, pulleys, screws, &c. in order to raise, cast, or sustain any weight, or produce any effect which could not be easily effected otherwise. The word is formed of the French *engin*, from the Latin *ingenium*, wit; from the ingenuity exerted in the invention of engines to augment the effect of moving powers.

ENGINE FOR EXTINGUISHING FIRE. See HYDROSTATICS, and FIRE ENGINE.

ENGINE (Pile), one contrived for driving piles. See PILE ENGINE.

ENGINE (Steam), a machine to raise water and communicate motion to other machinery by the force of steam. See STEAM ENGINE.

ENGINES (Pressure), for raising water by the pressure and descent of a column inclosed in a pipe, have been lately erected in different parts of this country. The principle now adverted to was adopted in some machinery executed in France, about 1731, (see Belidor de [illegible] Hydraul lib. iv. c. 1.) and was likewise [illegible]ed in Cornwall more than 40 years ago. Engines of this [illegible] been proposed by Mr. Close, Mr. Trevithick, and others; (see Gregory's Mechanics, vol. ii. p. 283). We shall here describe a water pressure engine designed by the late Mr. John Smeaton, in 1770, to be erected at Temple Newsham, Yorkshire, the seat of lord Irwin: and we must here return our most sincere acknowledgements to sir Joseph Banks, for indulging our draughtsman with Mr. Smeaton's original drawings, from which our Plate 61 was made. Fig. 1. is a section of the engine, through the middle of the cylinder and water pipes, and fig. 2. is a plan looking down upon the engine.

The engine is worked by a small stream of water brought to it by a pipe A: it falls from the surface of the engine 54 feet, and is conveyed from the engine by a pipe H, which has 12 feet fall from the engine to the surface of the water of the well, where it delivers. The engine works a pump which throws back part of the water to a reservoir 80 feet above the engine, and consequently 26 feet above the level of the head. The pipe A conducts the water to the pump B by one branch, and to the top of the cylinder D, which works the engine, by the other. The cylinder is of brass truly bored, and furnished with a solid piston, whose rod passes through a close stuffing box in the cylinder lid, where leather is packed round it so close that no water can leak by it. The upper end of the piston rod is keyed into a small box, which connects it with an iron rod *a*, sliding through a guide to make it move steadily. E is the working beam moving round a centre at *e*: it has an arch head at its outer end which is a segment of a circle struck from the centre *e*: it receives a chain by which the piston rod *a* is suspended. *d* is the pump rod jointed to the beam, and moving up and down with it. The forcer of the pump B is fixed to it at the lower end. *f* is a pipe which forms a communication between the top and bottom of the cylinder. It leads down into a chest upon which the cylinder is placed, and to which it is open at bottom: a short cylindrical pipe is fixed across withinside this chest, communicating with the pipe *f* at top, and with the pipe H (which conveys the water away from the engine) at the bottom. This short pipe has a water-tight division in the middle of it, so that there is no passage through it from *f* to H; but there are four square holes made in the pipe at equal distances round it, both above and below the division. One of the square holes below the division is represented by a dark square in fig. 1. A ring of brass is fitted upon the cylindric pipe, and slides up and down upon it, being packed with leather that no water may pass between the two cylinders. The sliding cylinder is just half the length of the other; and when it is slid up, as in the figure, it covers the four holes in the fixed pipe which are above the division, and opens the four holes below, allowing a passage from the bottom of the cylinder to the pipe H; on the contrary, when the slider is put down, the lower holes are closed and the upper ones are opened, making a passage from *f* to the bottom of the cylinder. The sliding valve has a pin projecting from each side, the pins being included between clifts made at the end of a forked lever *i*, moveable upon an axis which passes through the sides of the chest, and has a long lever (shewn by dotted lines behind the cylinder) fastened to it. By moving the upper end of this lever towards the engine, the sliding valve will be raised up, and by moving it in a contrary direction, the valve will be pushed down. *k* is a small iron rod jointed to the end of the long lever by one of its ends, and suspended by a hook from a spindle turning upon pivots. This spindle has several levers upon it: *mno* is a three armed lever, the arm *m* has a weight at the end, and is called the tumbling bob: *n* and *o* are two other arms made in the same piece with *m*: these two arms strike against a pin fixed across in the end of the rod *k*; *p* and *q* are two crooked levers by which the spindle is moved: these levers are struck by pins fixed in a wooden rod *r*, which is jointed to the beam and works up and down with it. *x* is a piece of wood fixed to the upright beam of the frame having pins projecting from it, which catch the tumbling bob *m*, and prevent its moving too far. S is a stop-cock in the main pipe, which regulates the quantity of water coming to the engine, and consequently the velocity with which the engine will work.

To describe the operation of the engine, we will suppose every thing to be in the position represented in the figure, except that the pipes, cylinder, and pump, are full of water. The engine is then at the top of its stroke, which is determined by the top of the arch, on the end of the beam, meeting a bolt put across the frame. The whole column of water 54 feet always presses upon the top of the piston; and in the present position of the sliding valve, the water contained in the lower part of the cylinder can get into the eduction pipe H, and thence away from the engine. This pressure added to the 12 feet fall below the engine causes the piston to descend, bringing down the beam and pump-rod *d* with it. The valve in the bottom of the pump now shut, and the water in the pump barrel being pressed by the piston, opens the other valve at X, and goes up the pipe Y to the reservoir, overcoming a column of water of 80 feet. When the engine gets to the middle of its stroke, a pin in the other side of the wooden rod *r* takes the lever *q* and forces it down, raising the tumbling bob *m* at the same time. By the time the piston arrives at the bottom of the cylinder, the tumbling bob is brought past the vertical position, and suddenly oversets by its own weight. The lever *n* now runs against the pin across the end of the rod *k*, and shoves it from the engine moving the long lever of the sliding valve, and the short lever *i* down, just in the contrary manner to what it is in the drawing. This closes the four lower holes in the fixed cylinder, and prevents the water going down the pipe H, and at the same instant opens the four upper holes, forming a communication between the top and bottom of the cylinder. The pressure of 66 feet, which caused the piston to descend, is now removed, and the column of water of 54 feet coming down the pipe A, forces open the lower valve of the pump (the valve at *x* closing and taking the bearing of the column of 80 feet), presses the underside of the pump bucket and raises it up, moving the beam and piston with it. There being now an equal pressure both above and below the piston, it will be moved up easily. When the piston arrives at the middle of its stroke, the pin *y* in the rod *r* takes the lever *p*, and raises it with it, until it arrives at the top of its stroke, when it passes the vertical position, and instantly falls over into the position represented in the figure. The lever *o* taking the end of the rod *k*, and putting it towards the engine, raises the sliding valve, opens the passage to the pipe H. The whole column of 66 feet now presses upon the piston and forces it down, overcoming a column of 80 feet upon the pump, though the diameter of the pump is larger than that of the cylinder: this happens from the chain of the piston acting upon a much longer lever than the pump. K and L are two air vessels upon the pipes A and Y.

Engines at London bridge, for supplying the metropolis with water. These, by reason of their great magnitude and importance, deserve particular notice. They are worked by the water of the river Thames, which at that part is so contracted in the narrow passages between the sterlings or wooden piers upon which the stone piers of the bridge are built, as to occasion a considerable fall at all times except at high or low water. The first five arches of the London end of the bridge are devoted to the water engines which supply the city with water. The largest of these machines is shewn in Plate 62 and 63. Plate 62 is an elevation of the engine taken from the sixth pier of the bridge, and Plate 63 is an elevation taken from the upper side of the bridge; the same letters of reference are used in both plates. AA, Plate 62, represents the sterling of the fifth pier of the bridge composed of a vast body of piles driven into the bed of the river, and the interstices filled up with chalk and gravel; upon the heads of these a set of horizontal beams are laid in the manner of joists, and all is made level by chalk and gravel. The fourth pier (BB, Plate 63) is made in the same manner. The water wheel EEFF is made of such a length as to fill the space between the two sterlings as exactly as possible without touching, and the bearings for the pivots of its axis are supported upon headstocks DD resting upon the sterlings. The water wheel has four rings EEEE, each having six arms morticed into the axis: each ring has 24 starts *ee* morticed into it, to which are nailed boards, upon which the water acts when turning the wheel round. FF is the main axis, upon the ends of which are fixed two large wooden wheels GG, round which cast-iron rings of cogs are fixed in segments. The wheels turn two trundles, which give motion to the pumps, of which there are six, three on each side of the water wheel. Only one of [illegible] are shewn in Plate 63; but as the other is exactly the same, one is sufficient. The axis on which the trundle H is fixed is of cast-iron; it has three cranks, *ab*, Plate 62, and another head behind the frame; *fgh* are cast-iron rods jointed to the cranks at their lower ends, and to the ends of the great levers or regulators IKL at the upper ends. The regulators have arches *ikl* at the other ends, struck from the centres of the beams, upon which chains are laid to give motion to the rods of the pumps MNO. By the motion of the water, the water-wheel is made to revolve on its axis, and the large cog-wheel G with it: by its cogs it turns the trundle H and cranks *ab*, which being arranged round the axis at equal intervals, successively elevate and depress the crank-rods *fgh* and regulators IKL, and give to the pump-rods a vertical motion.

The joints of the crank-rods *fgh* are made to screw together round the crank neck with brass between; by which means they work very pleasantly, and when worn can be screwed up tight again that they may have no shake. The crank-rods have a flaunch *m* in the middle of them, and are held together by four screws, so as they may be taken apart occasionally without difficulty when the pump buckets are to be drawn out of the barrels to new leather them. The joints at the end of the beam are made with brasses and screws to adjust them.

The beams or regulators are admirably well designed to be strong, with but little timber: they are formed of two pieces of timber, between which the cast-iron axes on which they turn are placed, and then the ends are bent to touch, and kept together by hoops and screw bolts. At the ends square pieces of wood *n* are let into both timbers; and thus when they are firmly bound together and held from sliding endwise upon each other, they form an excellent truss-beam, which cannot bend without stretching one timber and compressing the other. The pump-rods are attached to the arches at the ends of the beams by four iron chains each, as is shewn in Plate 63. The rod has a cross piece *o* fixed on the top of it, to which the two outside chains are screwed, and the lower ends of the same chains are fastened to the lower end of the arch. These chains act to push down the piston rods: the other two chains which raise the rods are fastened to the top of the arch and to the rods at lower ends, as shewn in the beam *l*. The pumps are forcing-pumps. *p* is a square iron pipe screwed down upon the groundsills of the engine frame; it has a flaunch at each end, on one of which a lid is screwed, and the other joins it to the section pipe Q, which brings the water on the top of the pipe. The three barrels MNO are screwed, having a valve in the joint, which allows water to enter the barrels, but prevents its return. From the bottom of each barrel proceeds a crooked pipe *p*, which communicates with another square pipe R, having valves at the joint to prevent any water getting back into the barrels. On the top of the pipe over each valve a lid is screwed, which [illegible] clean the valves when necessary (similar lids are screwed on the pipe P at the back towards the cranks). At the ends of the pipe R are flaunches, one of which receives a lid like the lower pipe P, and the other flaunch the pipe *r*, which conveys the water away from the pumps. The pistons or buckets of the pumps are solid, that is, without valves in them; and their action is as follows: When the pistons are drawn up they make a vacuum in the barrels, and the pressure of the atmosphere on the surface of the water from which the pipe Q draws raises the valves in the bottom of the barrels, and fills them. At the descent of the buckets the lower valves shut, and the water contained in the barrels can find no passage but through the valves in the pipe R; and when the pistons are drawn up again, these valves close, and the lower ones to give a fresh supply of water to the barrels. By the position of the cranks it always happens that one or other of the barrels is forcing the water into the force pipe; and as the strokes of the other set of pumps at the other end of the water-wheel are contrived to be intermediate or alternating to these, a constant succession is kept up. The pipe *r* is continued to the shore to convey the water into the streets, &c. A wooden cistern S is placed over the pumps to hold water, and keep a constant supply of it above the pistons. The whole engine is surrounded by a strong timber fence, which guards it from the injuries it might receive from vessels striking it at high water, when the liquid rises above the level of the sterlings nearly to the axis of the water-wheel. On the tops of these piles a large stage is built to serve as a road from the shore to the engine, and the underside of it supports the pipes *r*, Plate 63, which convey the water ashore. There are also other stages in different parts of the machine to support workmen when repairing it; these prevent the whole engine from being seen from the bridge at one view, and for this reason they are omitted in the drawing. The original engine was contrived by Mr. Beighton; but its present improvements are by Mr. Smeaton.

ENGINEER. *n. s.* (*engingnier*, Fr.) One who manages engines; one who directs the artillery of an army.—

> For 'tis the sport to have the *engineer*
> Hoist with his own petard.
>
> SHAKSP. HAMLET.

An engineer, in the military art, should be possessed of a perfect knowledge in mathematics, so as to delineate upon paper, or mark upon the ground, all sorts of forts, and other works proper for offence and defence. He should understand the art of fortification, so as not only to be able to discover the defects of a place, but to find a remedy proper for them; as also how to make an attack upon, as well as to defend, the place. Engineers should therefore be brave as well as ingenious. When at a siege they have narrowly surveyed the place, they are to make their report to the general, by acquainting him which part they judge the weakest, and where approaches may be made with most success. Their business is also to delineate the lines of circumvallation and contravallation, taking all the advantages of the ground; to mark out the trenches, places of arms, batteries, and lodgments, taking care that none of their works be flanked or discovered from the place.

E'NGINERY. *s.* (from *engine.*) 1. The act of managing artillery (*Milton*). 2. Engines of war; artillery (*Milton*).

To ENGI'RD. *v. a.* (from *gird.*) To encircle; to surround (*Shakspeare*).

ENGLAND, the southern and most considerable part of the island of Great Britain; bounded on the N. by Scotland, on the N.E. and E. by the German ocean, on the S. by the English channel, and on the W. by St. George's channel, the principality of Wales, and the Irish sea. It lies between 2° E and 7° W. lon. and between 49° and 56° N. lat. It is of a triangular form. From the S. Foreland in Kent, which may be termed the E point of the triangle, to Berwick upon Tweed, which is the N. its length in a straight line is 345 miles; from that point to the Lands-end, in Cornwall, which is the W. it is 425; and the breadth thence to the S. Foreland is 340. But the breadth diminishes, in general, as we approach the north; and, on the other hand, the length would be considerably more, if we were to follow all the windings of the sea-coast. "The face of the country in England," says Dr. Aikin, in his England Delineated, "affords all that beautiful variety which can be found in the most extensive tracts of the globe. In some parts, verdant plains extend as far as the eye can reach, watered by copious streams, and covered by innumerable cattle. In others, the pleasing vicissitudes of gently-rising hills and bending vales, fertile in corn, waving with wood, and interspersed with meadows, offer the most delightful landscapes of rural opulence and beauty. Some tracts abound with prospects of a more romantic kind; lofty mountains, craggy rocks, deep narrow dells, and tumbling torrents. Nor are there wanting, as a contrast to so many agreeable scenes, the gloomy features of black barren moors and wide uncultivated heaths. On the whole, however, few countries have a smaller proportion of land absolutely steril and incapable of culture." The richest parts are, in general, the midland and southern. Towards the N. it partakes of the barrenness of the neighbouring Scotland. The E. coast is, in many parts, sandy and marshy. A range of rude and elevated land, sometimes rising into lofty mountains, extends from the borders of Scotland to the very heart of England, running from N. to S. and forming a natural division between the E. and W. sides of the kingdom. Cornwall is also a rough hilly tract; and a similar character prevails in part of the adjacent counties. These mountainous tracts abound with various mineral treasures. The rivers are numerous; but the comparatively small extent of England will not permit them to vie, in length of course, with the great rivers on the continent. The most considerable of them are, the Thames, Severn, Medway, Trent, Ouse, Tyne, Tees, Eden, Avon, Derwent, Dee, Mersey, &c. which, with many others, are described under their respective heads. The lakes are neither numerous nor extensive. They are chiefly in the N.W. counties; and those of Westmorland and Cumberland, in particular, exhibit such varieties of beautifully romantic and picturesque scenery, as to have become, for some years past, the fashionable object of summer excursions from the metropolis, and every part of the country.

England, including Wales, when first invaded by the Romans, was divided into 17 petty states. 1. The Danmonii, Dunmonii, or Donmonii, inhabited Cornwall and Devonshire. 2. The Durotriges possessed Dorsetshire. 3. The Belgæ Somersetshire, Wiltshire, and the greater part of Hampshire. 4. The Atrebates inhabited Berkshire. 5. The Regni inhabited Surry, Sussex, and part of the coast of Hampshire. 6. The Cantii inhabited and gave name to Kent. 7. The Dobuni are placed by Ptolemy on the N. side of the Thames, near its head, in Gloucestershire and Oxfordshire. 8. The Cattieuchlani, Calyeuchlani, Cattidudani, or Cathicludani, inhabited Buckinghamshire, Bedfordshire, and Hertfordshire. 9. The Trinobantes possessed Essex and Middlesex. 10. The Iceni, whose country comprehended Suffolk, Norfolk, Cambridge, and Huntingdonshire, are by Ptolemy called Simeni, and by others Tigeni. Cambden is of opinion, that they were the people whom Cæsar calls Cenomagni. 11. The Coritani inhabited Northamptonshire, Leicestershire, Rutlandshire, Lincolnshire, Nottinghamshire, and Derbyshire. 12. The Cornavii possessed Warwickshire, Worcestershire, Staffordshire, Shropshire, and Cheshire. 13. The Silures inhabited Radnorshire, Brecknockshire, Glamorganshire, Herefordshire, and Monmouthshire. 14. The Demetæ inhabited part of Caermarthenshire, Pembrokeshire, and Cardiganshire. 15. The country of the Ordovices comprehended Montgomeryshire, Merionethshire, Caernarvonshire, Denbighshire, and Flintshire. 16. The Brigantes possessed Yorkshire, Durham, Lancashire, Westmorland, and Cumberland. 17. Northumberland was held by the Ottadini, Ottadeni, or Ottalini. Their country, according to some, reached from the Tyne to the Forth; though the most common opinion is, that it reached only to the Tweed. The above names are plainly Roman, but their etymology is doubtless British, though any attempts to trace their derivation from words in the old British language must now be attended with great uncertainty and obscurity. See Britain.

The total quantity of land in England and Wales is estimated at 37,265,855 acres; or, according to Dr. Grew, 46 millions: of this, in the year 1800, 11,350,501 acres were in tillage, 16,796,458 acres in pasturage, and the remainder uncultivated, including woodlands, and the sites of towns, roads, rivers, &c. The amount of the population in the same year was about 9½ millions: the number of inhabited houses was 1,598,278, of uninhabited houses 58,962, and of families 1,917,232. The number of parishes, churches, and chapels in England is about 10,500, in Wales about 1100. At the same period the total of his majesty's army, including regulars, fencibles, and militia, was 186,773: the navy and marines, 126,279: royal artillery 11,618. Since the above period our military establishment has considerably increased.

The government of this country is a limited monarchy; the legislative power residing in the king, the house of lords, and the house of commons; and the executive power in the king, the great officers of state, the judges, and all the inferior gradations of magistracy. Under this free constitution we have enjoyed a degree of prosperity and hapiness, so uniform and uninterrupted, as to be the admiration of surrounding nations. The civil division of the country is into circuits, and shires, or counties; these last are subdivided into wapentakes, or hundreds, and parishes. The circuits (which are six in number, and through each of which, for the most part, two of the judges administer justice twice a-year) contain 38 counties. They are, 1. The Home Circuit, which contains the counties of Essex, Herts, Kent, Surry, and Sussex. 2. The Norfolk Circuit, containing the counties of Bucks, Bedford, Huntingdon, Cambridge, Suffolk, and Norfolk. 3. The Oxford Circuit, containing the counties of Oxford, Berks, Gloucester, Worcester, Monmouth, Hereford, Salop, and Stafford. 4. The Midland Circuit, containing the shires of Warwick, Leicester, Derby, Nottingham, Lincoln, Rutland, and Northampton. 5. The Northern Circuit, containing the counties of York, Durham, Northumberland, Lancaster, Westmorland, and Cumberland. 6. The Western Circuit, containing Hants, Wilts, Dorset, Somerset, Devon, and Cornwall. Middlesex being the seat of the supreme court of justice, and Cheshire being a county palatine, are not included in any circuit. The established religion of England is the reformed, and its doctrines, as contained in the 39 articles, differ in little or nothing from those of the church of Scotland, though some of the English clergy give a different explanation of several of them than what is commonly offered. The late celebrated earl of Chatham said of the church of England, "We have a popish liturgy, a Calvinistic creed, and an Arminian clergy." It is one of the blessings of the British constitution, that all religions are tolerated in England, in consequence of which, people of all principles and professions are to be found in it. The only drawback is the Test Act, which, to the disgrace of the present liberal age, still excludes conscientious people of all professions from civil offices. This is the more illiberal, because no restriction of this kind takes place in Scotland. Since the reign of Henry VIII. the sovereign of England has been called, in public writs, the supreme head of the church; but this title conveys no spiritual meaning, as it only denotes the regal power to prevent any ecclesiastical differences, or in other words, substitutes the king in place of the pope, with regard to temporalities and the internal economy of the church. The kings of England never intermeddle in ecclesiastical disputes. They only give a sanction to the legal rights of the clergy. The church of England, under this description of the monarchical power, is governed by two archbishops, and 24 bishops, besides the bishop of Sodor and Man, who, not being possessed of an English barony, does not sit in the house of peers. (See ARCHBISHOP and BISHOP.) England contains about 60 archdeacons. Subordinate to them are the rural deacons, formerly styled archpresbyters, who signify the bishop's pleasure to his clergy, the lower class of which consists of parish priests (who are called rectors or vicars), deacons and curates. (See CURATE, DEACON, PARSON, and VICAR.) The ecclesiastical government of England is, properly speaking, lodged in the convocation; which is a national representation or synod, and answers pretty nearly to the idea of a parliament. They are convoked at the same time with every parliament; and their business is to consider of the state of the church, and to call those to an account who have advanced new opinions inconsistent with the doctrines of the church of England. Some high-flying clergymen during the reign of queen Anne, and in the beginning of that of George I. raised the powers of the convocation to a height that was inconsistent with the principles of religious toleration, and indeed of civil liberty: so that the crown was obliged to exert its prerogative of calling the members together, and of dissolving them; and ever since they have not been permitted to sit for any time, in which they could do business.

The house of commons since the late Irish union (see IRELAND) consists of 658 members: that is, 513 English representatives, 45 Scots, 100 Irish.

The chief mountains in England are the hills of Westmoreland, the Malvern hills in Worcester, the Peak in Derby, Snowdon and Plenlimmon in Wales.

The chief ports for the navy are, Portsmouth, Plymouth, Deptford, and Chatham.

The chief trading towns are London, Liverpool, Bristol, and Hull; Birmingham is famous for hard-ware manufactures, buttons, buckles, &c.; Sheffield, for cutlery; Manchester, for cottons, checks, dimities, &c.; Norwich, for druggets and camblets; Colchester, for its bays and serges, &c.; Cornwall and Devonshire supply tin and lead, &c.

There are five harbours on the coast of Sussex and Kent, namely, Hastings, Dover, Hythe, Romney, and Sandwich, which are called cinque-ports. These had anciently very considerable privileges, on account of their fitting out ships for the defence of the coast against any invader. They are still under the government of the constable of Dover castle. The five cinque-ports, with their three dependents, Rye, Winchelsea, and Seaford, send 16 members to the British parliament, who are styled Barons of the cinque-ports.

With respect to animals, wild and tame, we think it unnecessary to enter into any particular enumeration here; our readers in general are well acquainted with them, and where they are not we refer to the appropriate articles in this dictionary. And as to climate and seasons, we are unwilling to enter into a detail of our own opinions, as they might probably differ much from those of others: we would just observe, though, that the descriptions of foreigners are too often *unjustly unfavourable*; we say this on the authority of a Spanish nobleman, who arrived in England about midsummer 1802, and who was much delighted to find both climate and soil far more temperate and agreeable than most foreigners have asserted. Without, however, laying much stress upon the declaration of the noble Spaniard, we have found in our personal experience abundant reason for attachment to our native country; and we doubt not that our readers in general as well as ourselves can with pleasure adopt the language of the admirable poet with which we close this article.

> England, with all thy faults, I love thee still—
> My country! and, while yet a nook is left
> Where English minds and manners may be found,
> Shall be constrain'd to love thee. Though thy clime
> Be fickle, and thy year most part deform'd
> With dripping rains, or wither'd by a frost,
> I would not yet exchange thy sullen skies,
> And fields without a flow'r, for warmer France
> With all her vines; nor for Ausonia's groves
> Of golden fruitage, and her myrtle bow'rs.
> To shake thy senate, and from heights sublime
> Of patriot eloquence to flash down fire
> Upon thy foes, was never meant my task:
> But I can feel thy fortunes, and partake
> Thy joys and sorrows, with as true a heart
> As any thund'rer there. COWPER.

ENGLAND (New), a large country of North America, settled by the English. It comprehended four parts, viz. Massachuset's, New Hampshire, Connecticut, Rhode Island, and Providence Plantation. In 1783, when the independency of America was acknowledged, these parts were erected into four independent provinces. See each respective article.

ENGLECERIE, ENGLECHERIE, or ENGLESCHYRE, a term of great import among our ancestors, though now obsolete; properly signifying the quality of an Englishman. If a man were privately slain, or murdered, he was anciently accounted *francigena* (which comprehended every alien, especially the Danes) till englecerie was proved, i. e. till it was made to appear that he was an Englishman. Bracton, lib. iii.

E'NGLISH. *a.* (enᵹleꞅ, Saxon.) Belonging to England (*Shakspeare*).

To **E'NGLISH.** *v. a.* To translate into English (*Brown*).

ENGLISH LANGUAGE (History of). This, though a very intricate, is a very interesting subject, which we cannot persuade ourselves to omit. As the dissertations upon this topic of enquiry in the introduction to Dr. Johnson's Dictionary are, doubtless, in the hands of most of our learned readers, we shall prefer inserting here the result of the able investigations of Dr. Wallis; incorporating occasionally a few additions.

Dr. Wallis, after speaking of the old British tongue, and proving its great affinity with the eastern languages, shews how it came to be disused in Gaul and in England; and then points out the modifications occasioned by intermixture with the Saxon and the Norman languages. He then proceeds, as follows.

Thus, partly by these mixtures, partly by length of time, which causes strange alterations in all languages, the old Anglo-Saxon tongue was changed into the present English; which hath been received likewise into the chief parts of Scotland, which I believe chiefly happened when the Normans invaded England; for several of the English royal family, nobility and commonalty, being driven out of England, did with themselves carry their language into Scotland, which being improved by continual commerce, did so far prevail that the English and Scotch tongues are now the same; unless we should rather say, that the more polite part of Scotland, and that which is nearest England, has got the same inhabitants with those of England, who were descended from the Saxons, and formerly made part of the kingdom of Northumberland: for the Scotch Highlanders called the Lowlanders as well as the English, Sassons, that is, Saxons; but they formerly called themselves Gael, and Gaiothel; but the Highlanders and islanders, that is the inhabitants of the isles adjacent, who inhabit a great, though the more uncultivated, part of Scotland, which lies north-west, retain to this day the ancient British, or rather Irish tongue: for they are the remainders of the Picts, that is the most ancient Britains, who disdaining the Roman yoke, fled into the mountainous and rough countries, and mingled with the Scots, (the descendants of the Scythians or Goths) who came thither out of Ireland. Mr. Edmond Spencer, our famous poet, in his view of the state of Ireland, says, that there were two kinds of Scots (as may be gathered from Buchanan) the one Irin, or Irish Scots, the other Albin Scots; for those Scots are Scythians who arrived in the north parts of Ireland, where some of them after passed into the next coast Albine, now called Scotland, which after much trouble they possessed, and of themselves named Scotland; but in process of time (as it is commonly seen) the dominion of the part prevaileth in the whole, for the Irish Scots putting away the name of Scots, were called only Irish, and the Albine Scots, leaving the name of Albine, were called only Scots. Therefore it cometh thence that of some writers, Ireland is called Scotia Major, and that which now is called Scotland, Scotia Minor. And he says that the Scythians did from themselves name what we call Scotland, Scuttenland, which by contraction became Scutland, or Scotland. And we learn from the Chronicum Saxonicum, or Saxon Chronicle, and from Bede's Ecclesiast. Hist. 1. I. That Ireland was anciently called Scotta Ea, the Scots island; and the learned Bp. Gibson, in his explication of the names of places at the end of the Chronicum Saxonicum, p. 43, under the word Scottas, says, Scoti quo nomine apud Historicos nonnunquam appellantur Hiberni, ut et Scotiæ nomine vocatur Hibernia. That is, among some historians, the Irish are called by the name of Scots, as Ireland is by the name of Scotland. The English language then which we are to treat of, is a branch of the Teutonick, as is the present German, Dutch, Danish, and those that are a-kin to them; and our language differs from them, just as they do from one another. But I am afraid I have already exceeded the bounds of a preface, yet I cannot pass by two or three things, which if not necessary, may notwithstanding be entertaining to some persons; namely, some account of the mother tongues; and of the various changes that our language has undergone for several ages: afterwards we shall answer an objection made against our language, and then give our reasons for undertaking this work.

Because we have had occasion to make mention of the mother tongues, it may not be disagreeable to some readers if I give some account of them. Tongues then are either mother tongues, or dialects: mother tongues, are those out of which many dialects, like so many branches, are drawn. These branches of one mother tongue have some affinity one with another; but between the mother tongues themselves there is no affinity at all. The mother tongues, which are so wholly different one from another, are in number eleven; of which four are more noble, the other seven of less dignity; those we call the greater, these the less mother tongues. The same word in the original tongue, by diverse inflections and changes makes diverse dialects; as the same word in Latin, diversely varied, produces the Italian, Spanish, and French dialect: so the Latin calls a son-in-law, Gener; the Italian, Genero: the Spanish, Yerno; the French, Gendre; all which are Latin in their original, but according to the variation, are respectively appropriated to the aforesaid several dialects or sublanguages.

The four chief mother tongues are, Greek, Latin, Teutonick, and Sclavonick.

1. The Greek was anciently of very great extent, not only in Europe, but in Asia too, and Afric, where several colonies of that nation were planted; by which dispersion and mixture with other people, it did degenerate into several dialects. Besides those four that are commonly noted, the Doric, Ionic, Æolic, Attic; Herodotus doth mention four several dialects of the Ionic: the inhabitants of Rhodes, Cyprus, and Crete, had each of them some peculiarity in their language; and the present Coptic or Egyptian, seems both from the words and the character, to be a branch of this family, and was probably spread amongst that people in the days of Alexander the Great, upon his conquering of them: though some conceive that there were at least 30,000 families of Greeks planted in that country long before his time.

2. The Latin, though this be much of it a derivation from the Greek, (of which the present French, Spanish, and Italian are several offsprings or derivations) had anciently four several dialects, as Petrus Crinitus shews out of Varro.

3. The Teutonic or German, is now distinguished into Upper and Lower. The Upper hath two notable dialects. 1. The Danish, Scandian, or perhaps the Gothic, to which belongs the language used in Denmark, Norway, Swedeland, and Iceland. 2. The Saxon, to which appertain the several languages of the English, the Scots, the Frisian, and those on the north of the Elbe.

4. The Sclavonic is extended, though with some variation, through many large territories, Muscovy, Russia, Poland, Bohemia, Vandalia, Croatia, Lithuania, Dalmatia; and is said to be the vulgar language used amongst sixty several nations.—The languages of less extent are, 1. The Albanese, or old Epirotic, now used in the mountainous parts of Epirus.—2. The European Tartar, or Scythian, from which some conceive our Irish to have had its original.

As for the Turkish tongue, that is originally no other than the Asiatic Tartar, mixed with Armenian and Persian, some Greek, and much Arabic. 3. The Hungarian, used in the greatest part of that kingdom. 4. The Finnic, used in Finland and Lapland. 5. The Cantabrian, used among the Biscainers, who live near the ocean on the Pyrenean hills, bordering both upon France and Spain. 6. The Irish in Ireland, and from thence brought over into some parts of Scotland; though Mr. Camden would have this to be a derivation from the Welch. 7. The old Gaulish or British, which is yet preserved in Wales, Cornwall, and Britain in France. To this number Mr. Brerewood doth add four others, viz. 1. Arabic, now used in the steep mountains of Granata, which is yet a dialect from the Hebrew, and not a mother tongue. 2. The Cauchian in East-Friseland. 3. The Illyrian, in the isle of Veggia. 4. The Jazygian, on the north side of Hungary. Besides this difference of languages in their first derivation, every particular tongue hath its several dialects. Though Judæa were a region of a very narrow compass, yet was it not without its varieties of this kind, witness the story concerning Shibboleth and Sibboleth; and that of the Levite, who was discovered by his manner of speech; and St. Peter being known for a Galilean, (Judges xii. 18, and Matth. xxvi. 21). It is so generally in other countries, and particularly with us in England, where the northern and western inhabitants do observe a different dialect from other parts of this nation, as may appear from that particular instance mentioned by Verstegan: whereas the inhabitants about London would say, "I would eat more cheese if I had it;" a northern man would speak it thus, "Ay sud eat mare cheese gyn ay hed et;" and a western man thus, "Chud eat more cheese an chad it." Every one of these reputed mother tongues, except the Arabic, (and perhaps the Hungarian) was used in Europe during the time of the Roman empire. But whether they were all of them so ancient as the confusion of Babel doth not appear; there wants not great probability to the contrary for some of them.

It hath been the opinion of some, particularly Boxhornius, that the Scythian tongue was the common mother from which the Greek, Latin, German, and Persian were derived, as so many dialects; and Salmasius, in his treatise, De re Hellenisticâ, inclines to this opinion [P. 366.] "Scythia igitur quæ ad Septentrionem, omnes fermè gentes evomuit cum suis Linguis quæ Europam et Asiam inundârant." That is, most of the nations, with their languages, which over-ran Europe and Asia, came from northern Scythia. And Philip Cluverius conjectures, that Germans, Gauls, Spaniards, Britains, Swedes, and Norwegians, did anciently use the same language. One principal argument used for this is, the agreement of those remote nations in some radical words. Joseph Scaliger observes, that the words father, mother, brother, bond, &c. are used in the Persian tongue, with some little variety, in the same sense and signification as they are used with us. The learned Monsieur Pezron, in his Antiquities of Nations, seems to give a tolerable account of this matter. The Persian language, says he, is in many things like the Teutonic, or the High-Dutch; and this likeness is sometimes so apparent, that very learned men have stood amazed at it; which they needed not to be, had they well considered that those two nations, I mean the Persian and German, had anciently received very numerous colonies, that came from the same people, such as lived in Upper Asia, known by the name of Daes, in Latin Daæ, or Dai. For when they passed into Europe, they were called Dacians, and were the Daci of the Romans, who were often intermixed with the Getae, and that made the ancients sometimes confound the two nations. The Teutones had their origin from those Dacians that came from Asia, but more particularly from the Phrygians. These Dacians had several times sent colonies amongst the Parthians and Persians, their neighbours; and it may be said, that the Arsacidan Parthians reigned in Asia mainly by their help. These things considered, it is not to be wondered that the Persian language, notwithstanding the changes it may have undergone, had anciently, and even still retains, so much likeness in many things to the Teutonic.

Having thus done with what we had to say about the mother tongues, we shall now proceed to give some examples of the changes which our own language has suffered. Now, besides the common fate and corruption to which languages, as well as all other human things are subject, there are many particular things which may occasion the changes of a language: the mixture with other nations in commerce; marriages in royal families, which do usually bring some common words into a court-fashion; that affectation incident to some eminent men in all ages, of coining new words, and altering the common forms of speech for greater elegancy; the necessity of making other words, according as new things and inventions are discovered: besides the laws of foreign conquests usually extended to letters and speech, as well as territories; the conqueror commonly endeavouring to propagate his own language, as far as his dominions; which is the reason why the Greek and Latin are so universally known. For as no person in the provinces could enjoy the benefit of the Roman freedom with any honour, and remain ignorant of the Roman tongue: so in embassies, suits, appeals, or whatever provincial business happened, nothing was allowed to be handled or spoken in the Senate at Rome but in the Latin tongue. The laws also whereby the provinces were governed were all written in that language, as being in all of them, except the municipal cities, the ordinary Roman law. Moreover the pretors of the provinces were not allowed to deliver their judgments but in that language: and we read, in Dion Cassius, of a principal man in Greece, that by Claudius was put from the order of judges for being ignorant of the Latin tongue: and to the same effect in Valerius Maximus, l. 2. c. 2. that the Roman magistrates would not give audience to the Grecians (therefore much less to the barbarous nations) but in the Latin tongue. Besides this there were public schools erected in sundry cities of the provinces, which we find mentioned in Tacitus, Hierom, and others, in which schools the Roman tongue was the ordinary and allowed speech: these things were no small furtherance to that language. But instead of following these brave examples, we, for the advancement of our language, send our boys and girls to learn French, a custom, especially as it relates to the female sex, very ridiculous and nonsensical; but of this we may have an occasion to speak in another place. But to return to our point.

When a nation is over-spread with several colonies of foreigners, though this does not always prevail to abolish the former language, yet if they make any long abode, this must needs make such a considerable change and mixture of speech as will very much alter it from its original purity. Those learned languages which have now ceased to be vulgar, and remain only in books, by which the purity of them is regulated, may, whilst those books are extant and studied, continue the same without change. But all languages that are vulgar or common, as those learned ones formerly were, are upon the fore-mentioned occasions subject to so many alterations, that, in tract of time, they will appear to be quite another thing than what they were at first.

The liturgies of St. Basil, and St. Chrysostom, which are yet used in the Greek churches in their public worship, the one for solemn, the other for common days, have been a long time unintelligible to that people; so much is the vulgar Greek degenerated from its former purity. Brerewood's Enquiries, c. 2. and 6.

And Polybius, l. 3. c. 22. testifies, that the articles of truce between the Romans and Carthaginians could scarce be understood by the most learned Roman antiquaries 350 years after the time of their making. If any Englishman should now write or speak as our fore-fathers did about six or seven hundred years past, we should as little understand him as he would a foreigner. But I shall now proceed to give some specimens of our old language. What the Saxon language was at their first arrival into England about the year 440 doth not appear; but it is most probable that the changes and differences of it have been somewhat proportionable in several ages. The most ancient Saxon that we can meet with is in the ancient Saxon glossed Evangelists, which were wrote about the year of Christ 700, by Eadfride the eighth bishop of Lindiffarne, or Holy-Island; these Evangelists are divided according to the ancient canon of Eusebius, not into chapters; for Stephen Langton, archbishop of Canterbury, first divided the Holy Scriptures into chapters, about the year 1200, or some little time after; as Robert Stephens did into verses, who lived about the middle of the fifteenth century.

But the rev. Dr. Prideaux, in his valuable and learned performance called the Connection of the History of the Old and New Testament, part 1st, l. 5, makes Hugo de Sancto Caro the author of this invention, who being from a Dominican [illegible] advanced to the dignity of a cardinal, and the first of that order that was so, is commonly called Hugo Cardinalis. The Psalms indeed were always divided as at present. For St. Paul, Acts xiii. 33, in his Sermon at Antioch, in Pisidia, quotes the second Psalm. But as to the rest of the Holy Scriptures, the division of them into such chapters as at present is what the ancients never knew of. Belæus Cent. 3. p. 275. The Greek bibles among Christians anciently had their τιτλοι, and κεφαλαια, but the intent of them was rather to point out the sum or contents than to divide the books; and they were vastly different from the present chapters, for many of them contained only a very few verses, and some of them no more than one.

The Saxon is thus,

Fader uren thu arth or thu bist in heofnum or
Father our thou art or thou beest in Heaven,
in heofnas, sie gehalgud noma thin to cymeth ric
be hallowed name thine come kingdom
thin. Sie willo thin suae is in heofne and in
thine. Be will thine as is in Heaven and in
eortha. Hlaf userne oferwistlic sel us to-daeg;
Earth. Bread our over-substantial give us to day;
and forgef us Scylda usra, suae ue forgefon
and forgive us debts ours, as we forgive
Scyldgum usum. And ne inlead usith in
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Costunge, ah gefrig usich from Yfle.
temptation, but deliver us from evil.

The next oldest copy of the Lord's Prayer is the Dano-Saxon one, called Rushworth's. V. Wanley, p. 81. The age is about 900.

Fader ure thu the in heofunum earth. Beo
Father our thou who in Heaven art. Be
gehalgud thin noma. Cume to thine rice, weorthe
hallowed thine name. Come thy kingdom, be done
thin willa swa swa on heofune swilc on eorthe.
thy will as in Heaven as in earth.
Hlaf userne or ure daeghwamlicu or istondenlice
Bread our our daily hourly
sel us to-daeg and forlete us ure scylde swa swa
give us to day and forgive us our debts as
we ec forleten thaem the scyldigat with us and ne
we forgive them who trespass against us and not
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About the year 960, Elfrick, who was made abbot of Malmesbury, by king Edgar, thus writeth to one Sigeferth, against the marriage of priests; for one Ankor, who lived with Sigeferth, defended the marriage of priests, affirming it to be lawful. The epistle begins thus,

Ælfric abb, gret Sigeferth freondlice; me is gesaed that thu saedest be me that ic other taehte on Engliscen gewriten other eower Ancor aet ham med eow taehth; fortham the he swutelice saegth, that hit seo alefd that Maesse-preostas wel mot wifygon, and mine gewriten withcwetheth thysen. That is, *Elfric Abbot, greets Sigeferth friendly;* me is gesaed, *to me it is said,* that thu, *that thou,* saedest be me, *readest or speakest by me,* that ic other taehte; *that I other teach,* on Engliscen eewriten, *in my English writing,* other gower Ancor, *other or than your Ancor,* aet ham med eow taehth, *at home with you teacheth;* fortham the he swutelice saegth, *for then, or because that he soothly saith,* that hit seo alefd, *that it is allowed,* that maesse-preostas, *mass-priests,* wel motan wifigon, *may take wives,* and mine gewriten *and my writings,* withcwetheth thysen, *gainsayeth this.* Here any one may perceive a great many English words.

And in the Saxon homilies there is this remarkable expression; whence we may perceive, that Rome, at that time, had not resolved to derive her church from St. Peter. Scint Pouel the is the hegest lareow the we habbeth inne haelig kirk. *St. Paul who is the highest teacher we have in holy church.*

The charter that William the Conqueror gave to the city of London, which was about the year 1066, ran thus;

Williem king, greets Williem Bisceop and Godfred Portercfan, and ealle ya Burghwarn binnen London, Frencisce & Englise Frendlice, & ic kiden eoy, yeet ic wille yeet git ben ealra weera lagayweord, ye get weeran on Edwaerds daege kings. And ic will yeet aelc child by his fader Yrfaume, aefter his faders daege. And ic nelle ge wolian, yeet aenig man eoy aenis wrang beode. God eoy heald. That is,

William king greets William bishop, and Godfrey Portgreve [lord mayor] and all the Burgesses [citizens] within London, French and English friendly. And I make known to you, that I will that ye be all your law-worth that ye were in Edward's days the king. And I will that each child be his father's heir after his father's day. And I nill [will not] suffer that any man you any wrong beode [be done]. God save you, or keep.

In the famous psalter of Trinity College, written, as Mr. Wanley judges, in the time of king Stephen, (Wanley, p. 168.) the Lord's Prayer is thus; which a learned doctor places A. D. 1130.

Fader ure the art on heofone sy gebletsob name thin, swa swa on heofone and on eorthan breod (hlaf) ure degwamlich geof us to daeg, and forgeof us ageltes ura, swa swa we forgoofen agiltendum urum. And ne led us on costunge, ac alys us fram yfele swa beo hit.

About the year 1160 in the time of king Henry the Second, the Lord's Prayer was rendered thus, and sent over from Rome by pope Adrian, an Englishman, turned into rhime, that the people might more easily learn and remember it.

Ure fadyr in Heven rich,
Thy name be halyed ever lich,
Thou bring us thy michell blisse:
Als hit in Heaven y-doe,
Ever in Yearth beene it also:
That holy bread that lasteth ay,
Thou send it us this ilk day,
Forgive ous all that we have don,
As we forgivet uch other mon:
Ne let us fall into no founding,
Ac shield ous fro the fowle thing. *Amen.*

About a hundred years after, in the time of Henry the Third, it was rendered thus,

Fadir that art in Heven riche,
Thin helge nam it wurth the bliss,
Cumenan mot thy kingdom,
Thin holy will hit be all don,
In Heaven and in erdth also,
So sal it bin full well ic tro.
Gif us all bread on this day,
And forgif us ure sinnes,
As we do ure wider winnes:
Let us not in fonding fall,
Oac fro ifele thu syld us all. *Amen.*

About the year 1180, the Lord's Prayer was thus, as a learned gentleman transcribed it from the manuscript in Trinity College, the same manuscript that Mr. Wanley gives an account of, p. 169.

The salm that is cleped Pater-Noster.

Fader ure thu ert in hevene. Bledsed be thi name. cume thi rixlinge. Wurthe thi wil on eorthe swo hit is on hevene. Gif us to dai ure dailgwamliche bread. And forgive us ure gultes swo we don hem here the us agult habbeth shild us fram elche pine of helle aeles us of alle ivele. *Amen.* Swo hit wurthe.

About the year 1250.

Fadir ur that es in hevene,
Halud be thi nam to nevene:
Thou do us thi rich rike,
Thi will erd be wroght elk:
Als it es wroght in heven ay,
Ur ilk day brede give us to day:
Forgive thou all us dettes urs,
Als we forgive till ur detturs:
And ledde us in na fanding,
But sculd us fra ivel thing.

Wickliff's about 1380, Richard II.

Oure Fadir that art in hevenes, halowid be thi name. Thi kingdom come to. Be thi will doon in erthe as in hevene. Geve to us this dai our breed over othir substaunce. And forgeve to us oure dettis as and we forgeven to oure dettouris. And lede us not into temptacioun but deliver us from yvel. *Amen.* Evang. Matt. vi.

About two hundred years after this, in the time of Henry VI. (as appears by a large manuscript vellum Bible in the Oxford library, said to have been this king's, and by him to have been given to the Carthusians in London) it was rendered thus:

Our fadir that art in hevenes, halewid be thi name, thi kingdom come to thee, be thy will don in eerthe, as in hevene, give to us this day our breed over othre substanc, and forgive to us oure dettis, as we forgiven our dettouris, and lede us not into temptation, but delivere us from ivel. *Amen.*

In another manuscript of Wickliffe's translation, who lived in Richard the Second's time, about the year 1377, it is rendered with very small difference from this. And Michael Drayton, in his Polyolb. Cant. 8. hath these words out of Robert of Gloucester, concerning London's being walled by Lud.

Walls he let make al about, and yates up and doun,
And after Lud that was is name he cluped it Luds town;
The herte yate of the toun that yout stout ther and is,
He let hie clupie Ludgate after is o name i wis.
He let him tho' he was ded burie at thulk yate,
Theruore yut after him me clupeth it Ludgate.

About the year 1400, flourished the famous Chaucer, whose chief fault was the mixing too many French and Latin words with the English. I shall give you a taste of his style, in the description of the sudden stir and fear that happened upon the cock's being carried away by a fox:

The sely widowe and her daughters two
Herde the hennes crie and make wo,
And at the dore sterte they anon,
And saw the fox towarde the wood gon,
And bare upon his back the cocke away,
And cried out Harow and well away.
Aha, the foxe, and after hem they ran,
And eke with staves many another man:
Ran, Coll our dog, Talbot and eke Garlonde,
And Malkin with her distaffe in her honde.
Ran cow and calfe, and eke the very hogges,
For they so sore aferde were of the dogges,
And shouting of men, and of women eke,
They ran so, her herte thought to breke.
They yellen as fendes do in hell:
The duckes cried as men would them quell.

And the Wife of Bath's Tale begins thus:

In the old daies of king Artour,
(Of which the Bretons speaken great honour).
All was this loud fulfilled of fairy,
The elfe quene, with her joly company,
Daunsed full oft in many a grene mede:
This was the old opinion as I rede.
I speake of many an hundred yere ago,
But now can no man se elfes mo,
For now the great charite and praieres,
Of limitours and other holy freres,
That serchen every land, and every streme,
As thicke as motes in the sunne beme;
Blissing halles, chambers, kitchens and boures,
Citees, borowes, castelles and hie toures,
Thropes, bernes, shepens, and deiries,
This maketh that there been no fairies.

The Liber Festialis, about 1500.

Fader oure that arte in hevynes, halowed be thy name, thy gingdome come, thy wyl be doon in erth as it is in hevyn, our every daies brede gyve us to daye, and forgive us our trespasses as we forgyve theym that trespasse agaynste us, and lede us nat in temptacion but delyver us from all evyll.

Tyndale, A. D. 1526.

Our father which art in heaven, halowed be thy name. Let thy kingdom come. Thy will be fulfilled as well in earth as it is in heven. Geve us this daye ur dayly bred and forgeve us oure dettes as we forgeve ur detters. And leade us not into temptation, but delyver us from evyll. For thyne is the kyngdom and the power and the glorye for ever. *Amen.*

N. B. This is the first Lord's Prayer with the doxology in the close, being taken from the Greek; whereas those before were taken from the Latin, and want that part.

The Athanasian Creed in old English verse.

Who so wil be sauf to blis — *Whosoever will be saved.*
Before alle thinges nede to is
That he hald with alle his miht
The heli trauthe and leue it riht
Whilk bot ilken to queme — *Which Faith except.*
Hole and wemles it yheme.
Withouten drede bes thet forn
Fro Godes sight in al forlorn
Sothelic the heli trauht this lare — *The Faith is*
That o God inne thrinnesse

advanced to the dignity of a cardinal, and the first of that order that was so, is commonly called Hugo Cardinalis. The Psalms indeed were always divided as at present. For St. Paul, Acts xiii. 33, in his Sermon at Antioch, in Pisidia, quotes the second Psalm. But as to the rest of the Holy Scriptures, the division of them into such chapters as at present is what the ancients never knew of. Belæus Cent. 8. p. 275. The Greek bibles among Christians anciently had their τιτλοι, and κεφαλαια, but the intent of them was rather to point out the sum or contents than to divide the books; and they were vastly different from the present chapters, for many of them contained only a very few verses, and some of them no more than one.

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About the year 1250.

Fadir ur that es in hevene,
Halud be thi nam to nevene:
Thou do us thi rich rike,
Thi will erd be wroght elk:
• Als it es wroght in heven ay,
Ur ilk day brede give us to day:
Forgive thou all us dettes urs,
Als we forgive till ur detturs:
And ledde us in na fanding,
But sculd us fra ivel thing.

Wickliff's about 1380, Richard II.

Oure Fadir that art in hevenes, halowid be thi name. Thi kingdom come to. Be thi will doon in erthe as in hevene. Geve to us this dai our breed over othir substaunce. And forgeve to us oure dettis as and we forgeven to oure dettouris. And lede us not into temptacioun but deliver us from yvel. *Amen.* Evang. Matt. vi.

About two hundred years after this, in the time of Henry VI. (as appears by a large manuscript vellum Bible in the Oxford library, said to have been this king's, and by him to have been given to the Carthusians in London) it was rendered thus:

Our fadir that art in hevenes, halewid be thi name, thi kingdom come to thee, be thy will don in eerthe, as in hevene, give to us this day our breed over othre substanc, and forgive to us oure dettis, as we forgiven our dettouris, and lede us not into temptation, but delivere us from ivel. *Amen.*

In another manuscript of Wickliffe's translation, who lived in Richard the Second's time, about the year 1377, it is rendered with very small difference from this. And Michael Drayton, in his Polyolb. Cant. 8. hath these words out of Robert of Gloucester, concerning London's being walled by Lud.

Walls he let make al about, and yates up
  and doun,
And after Lud that was is name he cluped it
  Luds town;
The heite yate of the toun that yout stout ther
  and is,
He let hie clupie Ludgate after is o name i wis.
He let him tho' he was ded burie at thulk
  yate,
Theruore yut after him me clupeth it Ludgate.

About the year 1400, flourished the famous Chaucer, whose chief fault was the mixing too many French and Latin words with the English. I shall give you a taste of his style, in the description of the sudden stir and fear that happened upon the cock's being carried away by a fox.

The sely widuwe and her daughters two
Herde the hennes crie and make wo,
And at the dore sterte they anon,
And saw the fox towarde the wood gon,
And bare upon his back the cocke away,
And cried out Harow and well away.
Aha, the foxe, and after hem they ran,
And eke with staves many another man:
Ran, Coll our dog, Talbot and eke Garlonde,
And Malkin with her distaffe in her honde.
Ran cow and calfe, and eke the very hogges,
For they so sore aferde were of the dogges,
And shouting of men, and of women eke,
They ran so, her herte thought to breke.
They yellen as fendes do in hell:
The duckes cried as men would them quell.

And the Wife of Bath's Tale begins thus:

In the old daies of king Artour,
(Of which the Bretons speaken great honour).
All was this lond fulfilled of fairy,
The elfe quene, with her joly company,
Daunsed full oft in many a grene mede:
This was the old opinion as I rede.
I speake of many an hundred yere ago,
But now can no man se elfes mo,
For now the great charite and praieres,
Of limitours and other holy freres,
That serchen every land, and every streme,
As thicke as motes in the sunne beme;
Blissing halles, chambers, kitchens and boures,
Citees, borowes, castelles and hie toures,
Thropes, bernes, shepens, and deiries,
This maketh that there been no fairies.

The Liber Festialis, about 1500.

Fader oure that arte in hevynes, halowed be thy name, thy gingdome come, thy wyl be doon in erth as it is in hevyn, our every daies brede gyve us to daye, and forgive us our trespasses as we forgyve theym that trespasse agaynste us, and lede us nat in temptacion but delyver us from all evyll.

Tyndale, A. D. 1526.

Our father which art in heaven, halowed be thy name. Let thy kingdom come. Thy will be fulfilled as well in earth as it is in heven. Geve us this daye ur dayly bred and forgeve us oure dettes as we forgeve ur detters. And leade us not into temptation, but delyver us from evyll. For thyne is the kyngdom and the power and the glorye for ever. *Amen.*

N. B. This is the first Lord's Prayer with the doxology in the close, being taken from the Greek; whereas those before were taken from the Latin, and want that part.

The Athanasian Creed in old English verse.

Who so wil be sauf to blis	*Whosoever will be saved.*
Before alle thinges nede to is	
That he hald with alle his miht	
The heli trauthe and leue it riht	
Whilk bot ilken to queme	*Which Faith except.*
Hole and wemles it yheme.	
Withouten drede bes thet forn	
Fro Godes sight in ai forlorn	
Sothelic the heli trauht this isse	*The Faith is*
That o God inne thrinnesse	

And thrinness in onnesse
Wurchip we the more and lesse
Ne the hodes oht mengande *Neither confounding.*
Ne the stayelnes sondrande
For other hode of fader other of son *For there's*
Other of heli gost wil with am wun. *one person.*
Bot of fadir and son and heli goste *But the God-*
On is godes toningue that is moste *head of the*
Heven blis is til am thre *Father.*
Bi on in mikelhede to be
Whilk the fader whilk the son *Such as the Father.*
Whilk heli gost wil with am wun
Unshapen fader unshapen son is *The Father un-*
Unshapen heli goste in blis *create.*
Mikel fader mikel son ai *The father incomprehen-*
Mikel heli goste niht and dai. *sible.*
Ai lastand fader, ai lastand son *The Father eternal.*
Ai lastand heli be uton
And thow he ther noht thre ai lastand *Yet there are not three.*
Bot on ai lastand over al land
Als noht thre unmade ne mikel thre *As also they are not three.*
But on unmade and on mikel is he
Als so almihtand fader almihtand son *So likewise*
Almihtand heli goste to wun *the Father.*
And thowhether noht almihtand *And yet they are*
Bot on almihtand is licand *not three.*
Als so God fader God sone isse *The Father is God.*
God hali gost with am in blis
And thowhether noht godes thre *Yet they are not*
Bot on is god and ai sal he *three.*
For als sengellic hode god our louerde to be *So likewise the Father.*
Thurght cristen sothenes lette sal he
So thre godes or louerdes to kall *And yet not three.*
Thurght heli festnes forboden ar all.
The fadir of non made is be *The Father is made of*
Ne shapen ne kumed to he *none.*
The sone of only fader blis *The son is.*
Noht shapen ne made but kumed is
The heli goste of fadir and son mihtand *The Holy*
Noht shapen ne made bot forth comand *Ghost.*
Then o fadir noht fadres thre *Is one father.*
O son noht thre sones to be
O heli gost and no mo
Of tham comand ne thre no two
And this thrinnes thet with inne *And in this Tri-*
Noght first or latter noht more or minne *nity.*
Bot al thre persones lastand ai
To tham end evenmette are thai
So that bi alle als bifore saide is *So that in all*
And thrinnes in onnes *things.*
And onnesse in thrinnes ai
We to wurschip niht and dai
Who that then wil berihed be *He therefore that.*
So of the thrinnes leue he
And nede at hele that last ai sal *Furthermore.*
That the fleshede ai with al
Of our louerd Thu Crist forthi
That he trowe it trewli
Then is ever trauthe right *For the right.*
That we leve withalle our miht
That oure loverd Jhu Crist in blis
Godes sone and man he is
Gode of kinde of fadir kumed werld biforn *God of the substance.*
Man of kinde of moder into werld born
Fulli god fulli man livand; *Perfect God.*
Of schitful Saul and mannes fleshe beand
Even to the fadir thurght god heder *Equal to the*
Lasse then fader thurght man hede, *Father.*
That thof he be god and man; *Who, although.*
Noht two thowhether is Ihc Crist an
[illegible]
On noht thurght wendinge of godhed in fleshe *One not by.*
Bot thurght takynge of manhede in godnesshe
On al noht be menginge of stayelnes
Bot thurght onhede of hode that is
That tholed for oure hele doun went til helle *Who suffered.*
The thred dai ros fro dede so felle
Upstegh til heven sittes on right hand. *He ascended.*
Of god fadir alle miyhtand
And yhit for to come is he
To deme the quik and dede that be
Ate whos come alle men that are *At whose coming.*
Sal rise with thaire bodies thare
And thelde sal thai nil thai ne wil
Of thair awen dedes it
And that wel haf doun that dai: *And they that have*
Sal go to lif that lastes ai *done good.*
And iuel haf doun sal wende
In fire lastend withouten ende
This is the trauht that heli isse. *This is the truth.*
Whilk bot ilkon with miht hisse
Trewlic and fastlic trowe he
Saufe ne mai he never be.

In a Bible set forth with the king's licence, translated by Thomas Mathews, and printed in the year 1537, the Lord's Prayer is rendered thus.

O oure father which arte in heven, halowed be thy name. Let thy kingdome come. Thy will be fulfiled, as well in erth, as it is in heven. Geve us this daye oure dayly bred. And forgeve us our treaspases, even as we forgeve oure trespacers. And lead us not into temptacion, but deliver us from evyl. *Amen.*

We shall now present the reader with a passage or two, out of Gawin Douglas bishop of Dunkel, who flourished in the fourteenth and fifteenth centuries. And though some persons may blame me, that in producing specimens of the alteration of the English tongue, I quote a Scotch author; yet if those persons will give themselves the trouble of considering him more heedfully, they will perceive that his language, if it be not old English, is very near a-kin to it; and sir David Lindsay, in his prologue of the Complaint of Papingo, published at Edinburgh, 1592, seems to be of this opinion; for speaking of this author, he has these expressions:

Alace for ane, quhilk lamp was in this land,
Of eloquence the flow and balmy strand;
And in our Inglis [English] rhetorick the rose,
As of rubeis the carbunckle bin chose,
And as Phebus dois Cynthia precel,
So Gawin Douglas bishop of Dunkell.

And since I have cited this testimony of sir David Lindsay, concerning the bishop; I shall give you one more, and the rather, because it relates to my present design, and has not been mentioned by the publishers of the last edition of this author: and it is that of William Lisle, esq. in his preface to a Saxon Treatise De veteri novo Testamento. Ed. Lond. 1623. I lighted on Virgil Scottished by the reverend Gawin Douglas, bishop of Dunkel, and uncle to the earl of Angus, the best translation of that poet that ever I read: And though I found that dialect more hard than any of the former (as nearer the Saxon, because farther from the Norman) yet with help of the Latin, I made shift to understand it, and read the book more than once, from the beginning to the end; whereby I must confess I got more knowledge of that I sought than by any of the other: for as at the Saxon invasion many of the Saxons fled into Scotland, preserving in that realm unconquered, as the line royal, so also the language, better than the inhabitants here, under conquerors law and custom, were able.

Thus far Mr. Lisle. We shall now come to our good bishop. His conclusion to the translation of Virgil is in these words.

Thus up my pen and instrumentis full zore,
On Virgillis post I fix for euermore!
Neuir from thens sic matteris to discriue:
My muse sal now be clene contemplatiue,
And solitare, as doith the bird in cage;
Sen fer by worn all is my chyldis age,
And of my day is nere passit the half date,
That nature suld me granting, weill I wate.
Thus sen I feile doun sweyand the ballance,
Here I resigne up zoungkeris obseruance,
And wyl derek my labaouris euermoir,
Vnto the commoun welth and Goddis gloir.
A dew, gud readeris, God gif zou al gud nycht,
And eftir deith grant vs his hevinly lycht.

These verses need no explanation, since with a little change of a few letters they will appear to be clean English. But, however, I will explain a word or two; zore, ready; sic, such matters to describe; sen, since far outworn; suld, should; sweyand, swaying down; inclining, weighing; zoungkeris, young men; z, being frequently used among the old writers, and especially in this author, for y. I shall add a few verses more, wherein he desires that neither his rhyme nor words may be changed,

Ze writaris al, and gentle readaris eik,
Offendis not my volume, I beseik,
Bot rede lele, and tak gude tent in tyme,
Ze nouthir magil, nor mismeter my ryme,
Nor alter not my wourdis, I zou pray:
Lo this is all, bew schirris, have gude day.

In the fifteenth century lived the famous Edmond Spenser: we will present you with the 28th and 29th stanzas of the 9th canto of his Fairy Queen, b. 1. concerning Despair, for which sir Philip Sydney gave him 200*l.* and so conclude this head.

From whom returning sad and comfortless,
As on the way together we did fare,
We met the villain (God from him me bless)
That cursed wight, from whom I scap't whyl'ere,
A man of hell, that calls himself Despair,
Who first us greets, and after fair areeds
Of tydings strange, and of adventures rare;
So creeping close, as snake in hidden weeds,
Inquireth of our states and knightly deeds.
Which when he knew, and felt our feeble hearts,
Embost with bale, and bitter byting grief,
Which love had launced with his deadly darts,
With wounding words and terms of foul reprief,
He pluckt from us all hope of due relief,
That earst us held in love of lingring life;
The hopeless, hartless, gan the cunning thief
Perswade to die, to stint all further strife,
To me he lent this rope, to him a rusty knife.
With which sad instrument of hasty death,
That woful lover, loathing lenger light,
A wide way made to let forth living breath.
But I more fearful, or more lucky wight,
Dismay'd with that deformed dismal sight;
Fled fast away, half dead with dying fear, &c.

I should now proceed to give some instances of the change of our language from Shakspeare, Ben. Johnson, my lord Bacon, Milton, Waller, Cowley, &c. But they being books that are almost in every bodies hands, and my preface beginning already to swell, I shall defer it to a more convenient opportunity. I shall therefore endeavour to answer an objection that is made against our tongue, that it is made up of too many monosyllables: but this is a proof of its antiquity, if what Salmasius says be true, Certum quippe est, linguas omnes quæ monosyllabis constant esse cæteris antiquiores. Multis abundavit monosyllabis antiqua Græca, cujus vestigia, apud poetas qui antiquitatem affectârunt, remansêre non pauca. *De Re Hellènisticâ*, p. 390. For it is certain, that all those languages which consist of monosyllables are ancienter than the others; the Greek tongue abounded in monosyllables, of which there remain many instances among the ancient Greek poets. And indeed we have this advantage from our monosyllables, or words of one syllable, that we can express more matter in fewer words than any other language whatever; and though the monosyllables are not so fit for numbers, yet that happiness of composition, which is peculiar to our language with the Greek, makes our poetry as musical and harmonious as that of any nation in the world. And Mr. Dennis, who is a very good judge, says, the English is more strong, more full, more sounding, more significant, and more harmonious than the French. I know, says he, very well that a great many will be unwilling to allow the last; but he alleges this as a convincing proof of it, that we have blank verse which is not inharmonious, and the French pretend to no poetical numbers, without the assistance of rhime. And the learned and ingenious Mrs. Elstob has given variety of instances from our own poets, which sufficiently prove that there is a secret sweetness and harmony in verses made up of monosyllables artfully placed. Preface to her Saxon grammar, p. 13. I shall give three examples as brought by that lady from Mr. Dryden.

Arms and the man I sing who forc'd by fate.

From Mr. Creech.

Nor could the world have born so fierce a flame.

From sir John Denham's Coopers-Hill.

Tho' deep yet clear; tho' gentle yet not dull,
Strong without rage, without o'er flowing full.

And indeed there are no subjects but what may be nobly and beautifully clothed in an English dress; for our language has whatever is necessary to the making a language complete; for it is significant, easy, copious, and sweet. But we must not enlarge on these matters. I will however trespass a little more on your patience, and give you a specimen of the copiousness of our language in these two words, Anger and Striking. Anger, to express which passion, we use these following words, wrath, passion, passionate, sharpness, rage, fury, outrage, pet, choler, gaul, fume, storm, fret, pelt, chafe, vex, take-on, inflame, kindle, irritate, inrage, exasperate, incense, provoke, move, sullen, hasty, furious, outragious, mad, look big, placable, appease, stomach, animosity, heart-burning, tough, hot, snappish, curst, snarl, snuffle, &c. So for the word Striking we use, smite, bang, beat, bast, buffet, cuff, dash, hit, swinge, thump, thwack, blow, stripe, slap, flap, rap, tap, kick, wince, spurn, bob, box, fillip, whirret, yerke, pummel, punch, rebuff, percussion, repercussion, collision, &c. So we say to seeth, or boil broth, to stew prunes, poach eggs, coddle apples, bake bread, for which expressions to seeth, stew, poach, coddle, bake, the Latins have only the word *coquere*, for *pinsere* is neither to make bread nor bake it. "In pistrino autem pinsuntur farta, uti prodeat farina, unde panes confiant in furno, quo sint esui demum coquendi;" as our learned Gataker hath rightly observed. See, farther, our article GRAMMAR.

To ENGLUT *v. a.* (*engloutir*, French.) 1. To swallow up (*Shakspeare*). 2 To glut; to pamper (*Ascham*).

ENGONASIS, in astronomy. See HERCULES.

To ENGO'RE. *v. a.* (from *gore.*) To pierce; to prick: not used (*Spenser*).

To ENGO'RGE. *v. a.* (from *gorge*, Fr.) To swallow; to devour; to gorge (*Spenser*).

To ENGO'RGE. *v. n.* To feed with eagerness and voracity (*Milton*).

ENGRAFTING. See GARDENING and GRAFTING.

To ENGRA'IL. *v. a.* (from *grele*, French) To indent in curve lines (*Carew*).

To ENGRA'IN. *v. a.* (from *grain.*) To die deep; to die in grain (*Spenser*).

To ENGRA'PPLE *v. n.* (from *grapple.*) To close with; to contend with hold on each other (*Daniel*).

To ENGRA'SP. *v. a.* (from *grasp.*) To seize; to hold fast in the hand (*Spenser*).

To ENGRA'VE. *v. a.* pret. *engraved*; part. pass. *engraved* or *engraven*. (*engraver*, Fr.) 1. To picture by incisions in any matter (*Pope*). 2. To mark wood or stone (*Exodus*). 3. To impress deeply; to imprint (*Locke*). 4. (from *grave.*) To bury; to inter (*Spenser*).

ENGRA'VER. *s.* (from *engrave.*) A cutter in stone or other matter (*Hale*).

ENGRAVING, the art of cutting metals, precious stones, woods, &c. and representing thereon figures, letters, or whatever device or design the artist fancies. Engraving is properly a branch of sculpture, and is divided into several other branches, according to the matter whereon it is employed, and the manner of performing it.

History of Engraving.—Engraving is an art chiefly of modern invention; having its rise no earlier than the middle of the fifteenth century. The ancients, indeed, practised engraving on precious stones and crystals with very good success; and there are still many of their works remaining equal to any production of the later ages. But the art of engraving on plates and blocks of wood, to afford prints or impressions, was not known till after the invention of painting in oil. Of these last, the most ancient mode is that on wood; the first impressions on paper having been taken from carved wooden blocks. For this invention we are indebted to the brief-malers, or makers of playing cards, who practised the art in Germany about the beginning of the fifteenth century. From the same source may perhaps be traced the first idea of moveable types, which appeared not long after; for these brief-malers did not entirely confine themselves to the printing and painting of cards, but produced also subjects of a more devout nature; many of which, taken from holy writ, are still preserved in German libraries, with the explanatory text facing the figures; the whole engraved in wood. Thus a species of books was formed; such as, Historia sancti Johannis, ejusque Visiones Apocalypticæ; Historia Veteris & Novi Testamenti, known by the name of the Poor Man's Bible. These short mementos were printed only on one side; and two of them being pasted together, had the appearance of a single leaf. The earliest date on any of these wooden cuts is 1423. The subject is St. Christopher carrying the infant Jesus over the sea, preserved in a convent at Buxheim near Menningen. It is of a folio size, illuminated in the same manner as the playing cards; and at the bottom is this inscription,

> "Cristoferi faciem die quacunque tueris.
> Illa nempe die morte mala non morieris.
> Millesimo CCCC° XX° tertio."

Upon the invention of moveable types that branch of the brief malers business, so far as it regarded the making of books, was gradually discontinued; but the art itself of engraving on wood continued in an improving state; and towards the end of the fifteenth and beginning of the sixteenth century, it became customary for almost every one of the German engravers on copper to engrave on wood also. The works of Albert Durer in this style of engraving are justly held in the highest esteem. Italy, France, and Holland, have produced many capital artists of this kind; but for boldness and spirit we must see the prints of Christopher Jegher, who worked under the direction of Rubens, and was without doubt assisted by that great master The invention of that species of engraving distinguished by the appellation of *chiaro-scuro*, seems also to be justly claimed by the Germans, and first practised by Mair; one of whose prints of this kind is dated 1499. Many excellent works in chiaro-scuro have been produced in France; and in Italy it was honoured with the performances of Titian and Parmegiano; but the attempts of Jackson, Kirkall, and others in England, have not been equally successful. A set of excellent prints in this way have lately been published by J. Skippe, esq. a connoisseur and dillettante. In Germany, about A D. 1450, prints from engraved copper first made their appearance. The earliest date of a copperplate print is indeed only 1461 , but however faulty this print may be with respect to the drawing, or defective in point of taste, the mechanical part of the execution of it has by no means the appearance of being one of the first productions of the graver. We have also several other engravings evidently the work of the same master; in which the impressions are so neatly taken from the plates, and the engravings so clearly printed in every part, that, according to all appearance, they could not be executed in a much better manner in the present day, with all the conveniences which the copperplate printers now possess, and the additional knowledge they must necessarily have acquired in the course of more than three centuries. Hence we may fairly conclude, that if they were not the first specimens of the engraver's workmanship, they were much less the first efforts of the copperplate printer's ability. It is likewise to be observed, that Martin Shoen, who is said to have worked from 1460 to 1486, was apparently the scholar of Stoltzhirs; for he followed his style of engraving, and copied from him a set of prints, representing the passion of our Saviour. Now, allowing Stoltzhirs to have preceded his disciple only ten years, this carries the era of the art back to 1450, as was said above. There is no ground to suppose that it was known to the Italians till at least ten years afterwards. The earliest prints that are known to be theirs are a set of the seven planets, and an almanac by way of frontispiece; on which are directions for finding Easter from 1465 to 1517 inclusive: and we may be assured that the engravings were not antedated, as the almanac would have thus been less valuable. These prints must therefore have been executed in 1464, which is only four years later than the Italians claim. The three earliest Italian engravers are Finiguerra, Boticelli, and Baldini. If we are to refer these prints to any of the three, we shall naturally conclude them to be the work of Finiguerra or Baldini; for they are not equal either in drawing or composition to those ascribed to Boticelli, which we know at least were designed by him; and as Baldini is expressly said to have worked from the designs of Boticelli, it will appear most probable that they belong to Finiguerra. With respect to the invention of etching, it seems to be not well known to whom it is to be ascribed. One of the most early specimens is the print by Albert Durer, known by the name of the Cannon, dated 1518, and thought by some, with little foundation, to have been worked on a plate of iron. Another etching by the same artist is Moses receiving the tables of the law, dated 1524. It was also practised in Italy soon after this by Parmegiano, in whose etchings we discover the hand of the artist working out a system as it were from his own imagination, and striving to produce the forms he wanted to express. We see the difficulty he laboured under; and cannot doubt, from the examination of the mechanical part of the execution of his works, that he had no instruction; and that it was something entirely new to him. If the story is true, that he kept an engraver by profession in his house, the novelty of the art is rendered so much the more probable. He died in 1540. As to that species of engraving in which the modes of etching and cutting with the graver are united, it must have been found necessary immediately upon the invention of etching; it was, however, first carried to perfection by G. Audran, and is now almost universally practised, whether the work is in strokes or in dots. Engraving in dots, the present fashionable method, is a very old invention, and the only mode discovered by the Italians. Agostino de Musis, commonly called Augustine of Venice, a pupil of Marc Antonio, used it in several of his earliest works, but confined it to the flesh, as in the undated print of an old man seated upon a bank, with a cottage in the back ground. He flourished from 1509 to 1536. We also find it in a print of a single figure standing, holding a cup and looking upwards, by Giulio Campagnola, who engraved about the year 1516. The back ground is executed with round dots, made apparently with a dry point. The figure is outlined with a stroke deeply engraved, and finished with dots, in a manner greatly resembling those prints which Demarteau engraved at Paris in imitation of red chalk. The hair and beard are expressed by strokes. Stephen de Laulne, a native of Germany, followed the steps of Campagnola; and many of his slight works are executed in dots only. John Boulanger, a French artist, who flourished in the middle of the last century, and his contemporary Nicholas Van Plattenberg, improved greatly on this method, and practised it with much success. It is only, however, of late, that it has been considered as an object worthy of general imitation. John Lutma executed this kind of work with a hammer and a small punch or chisel. Engraving in mezzotinto was invented about the middle of the seventeenth century; and the invention has generally been attributed to prince Rupert. (See Mezzotinto). Engraving in aquatinta is quite a recent invention, and seems at once to have been carried to perfection by Sandby, and other artists of the present age. (See Aquatinta). Engraving with the tool was the kind originally practised, and it is yet retained for many purposes. For though etching be more easy, and other advantages attend it; yet where great regularity and exactness of the stroke or lines are required, the working with the graver is much more effectual: on which account it is more suitable to the precision necessary in the execution of portraits; as there every thing the most minute must be made out and expressed, according to the original subject, without any licence to the fancy of the designer in deviating from it, or varying the effect either by that masterly negligence and simplicity in some parts, or those bold sallies of the imagination and hand in others, which give spirit and force to history painting.

Historical engravings for the port folio and furniture seemed at one period to advance rapidly towards perfection, to which the late alderman Boydell greatly contributed; but the death of Strange, Hall, and Woollet, have been almost fatal to the hopes of the amateur, which rest, in a great measure, upon Heath, Sharp, Bromley, and a few others, as in this particular instance we do not include those eminent foreigners who have, or do at present reside in England. Whatever deficiencies we may discover in the prosecution of the arts in this country, is fortunately not to be attributed to want of genius, or relaxation from study in the artist; the chill of apathy in the rich, who view a wretched coloured aquatint with the same or more pleasure than the most laboured production of the graver, is the baleful cause of the languishing state of historical engraving. When persons capable of affording patronage are taught discrimination, future Woollets will fascinate the best judges of engraving. We have, however, some very fine engravers, in different departments, among whom it would be unjust not to specify the names of Milton, Scott, Lawry, and Mrs. Griffiths.

Engraving on copper, the making, correspondently to some delineated figure or design, such concave lines on a smooth surface of copper, either by cutting or corrosion, as render it capable, when charged properly with any coloured fluid, of imparting by compression an exact representation of the figure or design to paper or parchment. Whether we consider this branch of engraving, with regard to its utility, the pleasure it affords, or the difficulty that attends its execution, we cannot but confess, that on all these accounts it merits a distinguished rank among the polite arts. By this art the cabinets of the curious are adorned with the portraits of the greatest men of all ages and nations; and their memories, their most remarkable and most glorious actions, are transmitted to the latest posterity. By this art also, the paintings of the greatest masters are multiplied to a boundless number; and the lovers of the polite arts, however widely diffused, are enabled to enjoy those beauties, from which their distant situations would otherwise have for ever debarred them. Persons of moderate fortunes are hereby enabled to become possessed of all the spirit, and all the poetry, contained in those miracles of art, which seemed to have been reserved for the temples of Italy, or the cabinets of princes. When we reflect, that the engraver, beside the beauties of poetic composition, and the artful ordinance of design, is to express, merely by the means of light and shade, all the various tints of colours and clair-obscure; to give a relief to each figure, and a truth to each object; that he is now to paint a sky serene and bright, and then loaded with dark clouds; now the pure tranquil stream, and then the foaming, raging sea; that here he is to express the character of the man, strongly marked in his countenance, and there the minutest ornament of his dress; in a word, that he is to represent all even the most difficult objects in nature; we cannot sufficiently admire his vast improvements in this art, and that degree of perfection to which it is at this day arrived. See PRINTS

Different modes of engraving on copper.—These are as follow: 1. In strokes cut through a thin wax, laid upon the copper with a point, and these strokes bitten or corroded into the copper with aquafortis. (See ETCHING.) 2. In strokes with the graver alone, unassisted by aquafortis. In this instance, the design is traced with a sharp tool called a dry point, upon the plate; and the strokes are cut or ploughed upon the copper with an instrument distinguished by the name of a graver. 3. In strokes first etched and afterwards finished with the graver: by this expedient the two former methods are united. 4. In dots without strokes, which are executed with the point upon the wax or ground, bitten in with the aquafortis, and afterwards harmonized with the graver, by which instrument small dots are made; or with the graver alone, as in the flesh and finer parts, unassisted with the point. 5. In dots first etched and afterwards harmonized with the dry point, performed by a little hammer, called *opus mallei*, or the work of the hammer, as practised by Lutma and others. 6. In MEZZOTINTO. 7. In AQUATINTA. See these articles

Instruments used in engraving on copper.—The principal instruments used in engraving with the tool are, gravers, scrapers, a burnisher, an oilstone, and a cushion for bearing the plates. Gravers are made in several forms with respect to the points, some being square, others lozenge; the square graver for cutting broad and deep, and the lozenge for more delicate and fine strokes and hatches. La Bosse recommends, as the most generally useful, such as are of a form betwixt the square and lozenge: and he advises, that they should be of a good length; small towards the point, but stronger upwards, that they may have strength enough to bear any stress there may be occasion to lay upon them: for if they be too small and mounted high, they will bend; which frequently causes their breaking, especially if they be not employed for very small objects. The burnisher is used to assist in the engraving on some occasions, as well as to polish the plates. It is seven inches long, and made of fine steel well polished. The burnisher is formed at one end, and a scraper on the other, each about an inch and a half long from the point: betwixt them about four inches of the instrument is made round, and serves as a handle; and is thicker in the middle than at the necks, where the burnisher and scraper begin, which necks are only one quarter of an inch in diameter. The principal application of it in engraving, besides its use in polishing the plates, is to take out any scratches or accidental defacings that may happen to the plates during the engraving; or to lessen the effect of any parts that may be too strongly marked in the work, and require to be taken down. A cushion, as it is called, is generally used for supporting the plate in such a manner, that it may be turned every way with ease. It is a bag of leather filled with sand, which should be of the size that will best suit the plates it is intended to bear. They are round, and about nine inches over, and three inches in thickness. The dry point, or needle, which has been of late much used in engraving, is a tool like an etching point, which being drawn hard on the copper, cuts a stroke, and raises a burr; the burr is scraped off, and there remains a stroke more soft and delicate than can be produced in any other way.

Method of engraving on copper.—The cushion being laid on the table, the plate must be put upon it; and the graver being held in the hand in a proper manner, the point must be applied to the plate, and moved in the proper direction for producing the figures of the lines intended: observing, in forming straight lines, to hold the plate steady on the cushion; and where they are to be finer, to press more lightly, using greater force where they are to be broader and deeper. In making circular or other curve lines, hold your hand and graver steadily; and as you work, turn your plate upon the cushion against your graver, otherwise it will be impossible for you to make any circular or curved line with that neatness and command of hand you by this means may. After part of the work is engraved, it is necessary to scrape it with the scraper or graver, passed in the most level direction over the plate, to take off the roughness formed by the cutting of the graver; but great care must be taken not to incline the edge of the scraper or tool used, in such a manner that it may take the least hold of the copper, as it would otherwise produce false strokes or scratches in the engraving; and that the engraved work may be rendered more visible, it may afterwards be rubbed over with a roll of felt dipped in oil. In using the graver, it is necessary to carry it as level as possible with the surface of the plate; for otherwise, if the fingers slip betwixt them, the line that will be produced, whether curve or straight, will become deeper and deeper in the progress of its formation; which entirely prevents strokes being made at one cut, that will be fine at their extremities, and larger in the middle; and occasions the necessity of retouching to bring them to that state. For this reason, it is very necessary for those who would learn to engrave in perfection, to endeavour, by frequent trials, to acquire the habit of making such strokes both straight and curving, by lightening or sinking the graver with the hand, according to the occasion. If, after finishing the design, any scratches appear, or any part of the engraving be falsely executed, such scratches, or faulty parts, must be taken out by the burnisher, and further polished, if necessary, by the above-mentioned roll. The plate being thus engraved, it is proper to round off the edges, by using first a rough file, and afterwards a smoother; and to blunt the corners a little by the same means: after which, the burnisher should be passed over the edges to give it a farther polish. In the conduct of the graver and dry point consists all the art; for which there are no rules to be given: all depending on the habitude, disposition, and genius, of the artist. However, besides the explanations already given, some general observations and directions may not be improper. As the principles of engraving are the same with those of painting, a person cannot expect to attain any considerable degree of perfection in this art who is not a good master of design; and therefore he ought to be well acquainted both with perspective and architecture: for the former, by the proper gradations of strong and faint colours, will enable him to throw backwards the figures and other objects of the picture or design which he purposes to imitate; and the latter will teach him to preserve the due proportion of its several orders, which the painter often entrusts to the discretion of the engraver. In order to preserve equality and union in his works, the engraver should always sketch out the principal objects of his piece before he undertakes to finish them. In working, the strokes of the graver should never be crossed too much in a lozenge manner, particularly in the representation of flesh, because sharp angles produce the unpleasing effect of lattice-work, and take from the eye the repose which is to it agreeable in all kinds of picturesque designs: we should except the case of clouds, tempests, waves of the sea, the skins of hairy animals, or the leaves of trees, where this method of crossing may be admitted. But in avoiding the lozenge, it is not proper to get entirely into the square, which would give too much of the hardness of stone. In conducting the strokes, the action of the figures, and of all their parts, should be considered; and it should be observed how they advance towards, or recede from the eye; and the graver should be guided according to the risings or cavities of the muscles or folds, making the strokes wider and fainter in the light, and closer and firmer in the shades. Thus the figures will not appear jagged; and the hand should be lightened in such a manner, that the outlines may be formed and terminated without being cut too hard; however, though the strokes break off where the muscle begins, yet they ought always to have a certain connection with each other, so that the first stroke may often serve by its return to make the second, which will show the freedom of the engraver. In engraving the flesh, the effect may be produced in the lighter parts and middle tints by long pecks of the graver, rather than by light lines; or by round dots; or by dots a little lengthened by the graver; or, best of all, by a judicious mixture of these together. In engraving the hair and the beard, the engraver should begin his work by laying the principal grounds, and sketching the chief shades in a careless manner, or with a few strokes; and he may finish it at leisure with finer and thinner strokes to the extremities. When architecture or sculpture is to be represented, except it be old and ruinous buildings, the work ought not to be made very black; because, as edifices are commonly constructed either of stone or white marble, the colour, being reflected on all sides, does not produce dark or brown shades as in other substances. White points must not be put in the pupils of the eyes of figures, as in engravings after paintings; nor must the hair or beard be represented as in nature, which makes the locks appear flowing in the air; because in sculpture there can be no such appearances. In engraving cloths of different kinds, linen should be done with finer and closer lines than other sorts, and be executed with single strokes. Woollen cloth should be engraved wide, in proportion to the coarseness or fineness of the stuff, and with only two strokes; and when the strokes are crossed, the second should be smaller than the first, and the third than the second. Shining stuffs, which are generally of silk or satin, and which produce flat and broken folds, should be engraved more hard and more straight than others, with one or two strokes, as their colours are bright or brown; and between the first strokes others smaller must be joined, which is called interlining. Velvet and plush are expressed in the same manner, and should always be interlined. Metals, as armour, &c. are also represented by interlining, or by clear single strokes. In architecture, the strokes which form the rounding object should tend to the point of sight; and when whole columns occur, it is proper to produce the effect as much as possible by perpendicular strokes. If a gross stroke is put, it should be at right angles, and wider and thinner than the first stroke. In engraving mountains, the strokes ought to be frequently discontinued and broken, for sharp and craggy objects; and they should be straight, in the lozenge manner, and accompanied with long points or dots; and rocks should be represented by cross strokes more square and even. Objects that are distant towards the horizon should be kept very tender, and slightly charged with black. Waters that are calm and still are best represented by strokes that are straight, and parallel to the horizon, interlined with those that are finer; omitting such places as, in consequence of gleams of light, exhibit the shining appearance of water; and the form of objects reflected from the water, at a small distance upon it, or on the banks of the water, are expressed by the same strokes, retouched more strongly or faintly as occasion may require, and even by some that are perpendicular. For agitated waters, as the waves of the sea, the first strokes should follow the figure of the waves, and may be interlined, and the cross strokes ought to be very lozenge. In cascades, the strokes should follow the fall, and be interlined. In engraving clouds, the graver should sport when they appear thick and agitated, in turning every way according to their form and their agitation. If the clouds are dark, so that two strokes are necessary, they should be crossed more lozenge than the figures, and the second strokes should be rather wider than the first. The flat clouds, that are lost insensibly in the clear sky, should be made by strokes parallel to the horizon, and a little waving; if second strokes are required, they should be more or less lozenge; and when they are brought to the extremity, the hand should be so lightened that they may form no outline. The flat and clear sky is represented by parallel and straight strokes, without the least turning. In landscapes, the trees, rocks, earth, and herbage, should be etched as much as possible; nothing should be left for the graver but perfecting, softening, and strengthening. The dry point produces an effect more delicate than the graver can, and may be used to great advantage in linen, skies, distances, ice, and often in water, especially in small engravings. In most things it is proper to etch the shadows, only leaving the lighter tints for the dry point, graver, &c.

To imitate drawings with chalk on copper.—In performing this a mixture is used of varied and irregular dots, made more or less soft, so as to resemble the grain produced by the chalks on paper. Every stroke of the chalks on paper may be considered as an infinite number of adjoining points, which are the small eminences of the grain of the paper touched by the chalk in passing over it. When the copper-plate has been polished and varnished, or properly prepared, as in the common method of engraving, the drawing to be imitated may be counterproved on the varnish of the plate. If this cannot be conveniently done, black lead pencil, or red chalk, must be applied to varnished or oiled paper; and by means of this chalk or pencil, all the traces of the original will be transmitted to varnish. The outlines of the object must be formed in the etching by points, whose magnitude and distance must be determined by the quality of the strokes in the original drawing. The artist may be provided with pointed instruments or needles of various sizes with single or double points. In forming the light and shade, he should distinguish between those hatches which serve to express the perspective of the object, and those which form the ground of it. The principal hatches should be more strongly marked: the middle tints, if etched, should be marked lightly, or they may be left till the varnish is taken off, and be perfected with a greater degree of softness, by needles or the point of the graver, as the original may require. There is nothing peculiar in the method of applying the aquafortis in this kind of engraving; but it may be observed, that it should not be left so long as to corrode the lighter parts too much: if the light parts are sufficiently corroded, they may be stopped out with turpentine varnish and lamp black mixed together, and the aquafortis may be applied again to the stronger parts; for it will be no detriment to them if the points which compose the shade burst into one another, provided the extreme be avoided. When the work of the aquafortis is finished, and the varnish taken off the copper, it will be necessary in the softest parts, such as the flesh, &c. to interstipple with proper points; as an effect will be thus produced more delicate than it is possible to attain, with the aquafortis only; and the strongest shades will require additional strength to be given them with small strokes of the graver. Drawings made with chalks of different colours may be imitated in this manner, if a plate be provided for every colour.—This method of engraving is intended to form a kind of deception, so that the connoisseur may not be able, on the first inspection, to distinguish between the original drawing and the engraving made in imitation of it; and it is extremely useful, as it serves to multiply copies of drawings left by those masters who excelled in the use of chalks, and thus to form and improve young artists, who could not have access to the originals in the practice of drawing.

Engraving on glass is performed exactly by the same process as etching on copper; only using the fluoric instead of the nitrous acid. See Etching.

Engraving on precious stones is the representing of figures, or devices in relievo or indented, on divers kinds of hard polished stones. The ancients excelled in this art; there being divers antique gates, cornelians, and onyxes, which surpass any thing of that kind the moderns have produced. Pyrgoteles among the Greeks, and Dioscorides under the first emperors of Rome, are the most eminent engravers we read of: the former was so esteemed by Alexander, that he forbad any body else to engrave his head; and Augustus's head, engraven by the latter, was deemed so beautiful, that the succeeding emperors chose it for their seal. All the polite arts having been buried under the ruins of the Roman empire, the art of engraving on stones met with the same fate. It was retrieved in Italy at the beginning of the fifteenth century, when one John of Florence, and after him Dominic of Milan, performed works of this kind no way to be despised. From that time, such sculptures became common in Europe, and particularly in Germany, whence great numbers were sent into other countries: but they came short of the beauty of those of the ancients, especially those on precious stones; for, as to those on crystal, the Germans, and after their example the French, &c. have succeeded well enough. In this branch of engraving either the diamond or emery may be used. The diamond, which is the hardest of all stones, is only cut by itself, or with its own matter. The first thing to be done in this branch of engraving is, to cement two rough diamonds to the ends of two sticks big enough to hold them steady in the hand, and to rub or grind them against each other till they be brought to the form desired. The dust or powder that is rubbed off serves afterwards to polish them, which is performed with a kind of mill that turns a wheel of soft iron. The diamond is fixed in a brass dish; and, thus applied to the wheel, is covered with diamond dust, mixed up with the oil of olives; and when the diamond is to be cut facetwise, they apply first one face, then another, to the wheel. Rubies, sapphires, and topazes, are cut and formed the same way on a copper wheel, and polished with tripoli diluted in water. As to agates, amethysts, emeralds, hyacinths, granites, rubies, and others of the softer stones, they are cut on a leaden wheel, moistened with emery water, and polished with tripoli on a pewter wheel. Lapis lazuli, opal, &c. are polished on a wooden wheel. To fashion and engrave vases of agate, crystal, lapis lazuli, or the like, a kind of lathe, like that used by pewterers, is used to hold the vessels, which are to be wrought with proper tools: that of the engraver generally holds the tools, which are turned by a wheel; and the vessel is held to them to be cut and engraved, either in relievo or otherwise; the tools being moistened from time to time with diamond dust and oil, or at least emery and water. To engrave figures or devices on any of these stones, when polished, such as medals, seals, &c. they use a little iron wheel, the ends of whose axis are received within two pieces of iron, placed upright, as in the turner's lathe; and to be brought closer, or set further apart, at pleasure; at one end of the axis are fitted the proper tools, being kept tight by a screw. Lastly, The wheel is turned by the foot, and the stone applied by the hand to the tool, and is shifted and conducted as occasion requires. The tools are generally of iron, and sometimes of brass; their form is various, but they generally bear some resemblance to chisels, gouges, &c. Some have small round heads, like buttons, others like ferrels, to take the pieces out, and others flat, &c. When the stone has been engraven, it is polished on wheels of hair brushes and tripoli.

Engraving on steel is chiefly employed in cutting seals, punches, matrices, and dyes, proper for striking coins, medals, and counters. The method of engraving with the instruments, &c. is the same for coins as for medals and counters: all the difference consists in their greater or less relievo; the relievo of coins being much less considerable than that of medals, and that of counters still less than that of coins. Engravers in steel commonly begin with punches, which are in relievo, and serve for making the creux or cavities of the matrices and dyes; though sometimes they begin with the creux or hollowness; but then it is only when the intended work is to be cut very shallow. The first thing that is done is designing the figures; the next is the moulding them in wax, of the size and depth they are to lie, and from this wax the punch is engraven. When the punch is finished they give it a very high temper, that it may the better bear the blows of the hammer with which it is struck, to give the impression to the matrice. The steel is made hot to soften it, that it may the more readily take the impression of the punch; and after striking the punch on it in this state, they proceed to touch up or finish the strokes and lines, where, by reason of their fineness, or the too great relievo, they are any thing defective, with steel gravers of different kinds; chisels, flatters, &c. being the principal instruments used in graving on steel. The figure being thus finished, they proceed to engrave the rest of the medal, as the mouldings of the border, the engrailed ring, letters, &c. with little steel punches, well tempered, and very sharp.

Engraving on Wood. (See CUTTING.) It is performed in three different modes, viz. 1. With a single block, on which the design is traced with a pen, and those parts which should be white carefully hollowed out. This block is afterwards printed by the letter press printers, in the same manner as they print a book. 2. With two, three, or more blocks; the first having the outliness cut upon it; the second is reserved for the darker shadows; and the third for the shadows which terminate upon the lights; and these are substituted in their turn, each print receiving an impression from every block. This mode of engraving is called chiaro-scuro, and was designed to represent the drawings of the old masters. 3. On wood and on copper: in these the outline is engraved in a bold dark style upon the copper: and two or more blocks of wood are substituted to produce the darker and lighter shadows, as before.

To ENGRI'EVE. *v. a.* To pain, to vex (*Spenser*).

To ENGRO'SS. *v. a.* (*grossir*, French.) 1. To thicken; to make thick (*Spenser*). 2. To increase in bulk (*Wotton*). 3. To fatten; to plump up (*Shakspeare*). 4. To seize in the gross (*South*). 5. To purchase the whole of any commodity for the sake of selling at a high price. 6. To copy in a large hand (*Pope*).

ENGRO'SSER. *s.* (from *engross.*) He that purchases large quantities of any commodity, in order to sell it at a high price (*Locke*).

ENGRO'SSMENT. *s.* (from *engross.*) Appropriation of things in the gross; exorbitant acquisition (*Swift*).

To ENGUA'RD. *v. a.* (from *guard.*) To protect; to defend: not used (*Shakspeare*).

ENGYTHECA, in antiquity, a cupboard.

To ENHA'NCE. *v. a.* (*enhausser*, French.) 1. To lift up; to raise on high: obsolete (*Spenser*). 2. To raise; to advance (*Locke*). 3. To raise in esteem (*Atterbury*). 4. To aggravate (*Hammond*).

ENHA'NCEMENT. *s.* (from *enhance.*) 1. Increase; augmentation of value (*Bacon*). 2. Aggravation; increase of ill (*Government of the Tongue*).

ENHARMONIC, in the ancient music, one of their genera, so called from its superior excellence. This genus, says Brossard, was greatly used in the Greek music, especially in dramatic performances; but as those almost insensible elevations and fallings of the voice wherein it consists are too difficult, and as they sometimes make the concord false, it has been laid aside, and even lost, though many great authors have attempted to recover it. Others say it is a species of music, the modulation whereof proceeds by intervals less than semitones, as the semitone minor, enharmonic diesis, and third major.

ENIF, an Arabic word signifying nose: in astronomy, it is applied to the star ε in Pegasus, called *Enif Alfaras*, the Horse's Nose.

ENI'GMA. *s.* (*ænigma*, Latin.) A riddle; an obscure question; a position expressed in remote and ambiguous terms. See ÆNIGMA.

ENIGMA'TICAL. *a.* (from *enigma.*) 1. Obscure; ambiguously or darkly expressed (*Brown*). 2. Cloudy; obscurely conceived or apprehended (*Hammond*).

ENIGMA'TICALLY. *ad.* In a sense different from that which the words in their familiar acceptation imply (*Brown*).

ENI'GMATIST. *s.* (from *enigma.*) One who deals in obscure and ambiguous matters; a maker of riddles (*Addison*).

To ENJO'IN. *v. a.* (*enjoindre*, French.) To direct; to order; to prescribe (*Tillotson*).

ENJO'INER. *s.* One who gives injunctions.

ENJO'INMENT. *s.* Direction; command (*Brown*).

To ENJO'Y. *v. a.* (*enjouir*, French.) 1. To feel or perceive with pleasure (*Addison*). 2. To obtain possession or fruition of (*Milton*). 3. To please; to gladden; to exhilarate; to delight (*More*).

To ENJO'Y. *v. n.* To live in happiness (*Milton*).

ENJO'YER. *s.* One that has fruition.

ENJO'YMENT. *s.* Happiness; fruition (*Tillotson*).

ENIXUM, among the older chemists, a natural sulphat of soda. The sal enixum of Paracelsus is the residuum, or caput mortuum, resulting from a distillation of spirit of nitre, with sulphuric acid of a white colour, and pleasant subacid taste.

To ENKI'NDLE. *v. a.* (from *kindle.*) 1. To set on fire; to inflame (*Shakspeare*). 2. To rouse passions (*Shakspeare*). 3. To incite to any act or hope (*Shakspeare*).

To ENLA'RGE. *v. n.* (*enlargir*, French.) 1. To make greater in quantity or appearance. 2. To increase any thing in magnitude; to extend (*Locke*). 3. To increase by representation; to magnify. 4. To dilate; to expand (*Corinthians*). 5. To set free from limitation (*Shakspeare*). 6. To extend to more purposes or uses (*Hooker*). 7. To amplify; to aggrandize (*Locke*). 8. To release from confinement (*Shakspeare*). 9. To diffuse in eloquence (*Clarendon*).

To ENLA'RGE. *v. n.* To expatiate; to speak in many words (*Clarendon*).

ENLA'RGEMENT. *s.* (from *enlarge.*) 1. Increase; augmentation; further extension (*Hayward*). 2. Release from confinement (*Shakspeare*). 3. Magnifying representation (*Pope*). 4. Expatiating speech; copious discourse (*Clarendon*).

ENLA'RGER. *s.* Amplifier; one that increases or dilates any thing (*Brown*).

To ENLI'GHT. *v. a.* (from *light.*) To illuminate; to supply with light (*Pope*).

To ENLI'GHTEN. *v. a.* (from *light.*) 1. To illuminate; to supply with light (*Psalms*). 2. To quicken in the faculty of vision (*Samuel*). 3. To instruct; to furnish with increase of knowledge (*Rogers*). 4. To cheer; to exhilarate; to gladden. 5. To illuminate with divine knowledge.

ENLI'GHTENER. *s.* (from *enlighten.*) 1. Illuminator; one that gives light (*Milton*). 2. Instructor.

To ENLI'NK. *v. a.* (from *link.*) To chain to; to connect (*Shakspeare*).

To ENLI'VEN. *v. a.* (from *life*, *live.*) 1. To make quick; to make alive; to animate. 2. To make vigorous or active (*Swift*). 3. To make sprightly or vivacious. 4. To make gay or cheerful in appearance.

ENLI'VENER. *s.* That which animates; that which invigorates (*Dryden*).

To ENLU'MINE. *v. a.* (*enluminer*, Fr.) To illumine; to illuminate: not in use (*Spenser*).

ENMANCHE, in heraldry, is when lines are drawn from the centre of the upper edge of the chief to the sides, to about half the breadth of the chief; signifying sleeved, or resembling a sleeve, from the French *manche*.

E'NMITY. *s.* (from *enemy.*) 1. Unfriendly disposition; malevolence; aversion (*Locke*). 2. Contrariety of interests or inclinations; mutual malignity (*Milton*). 3. State of opposition (*James*). 4. Malice; mischievous attempts (*Atterbury*).

To ENMA'RBLE. *v. a.* (from *marble.*) To turn to marble: obsolete (*Spenser*).

To ENMESH. *v. a.* (from *mesh.*) To net; to entangle; to entrap (*Shakspeare*).

ENNEADECATERIS, in chronology, a cycle, or period of nineteen solar or lunar years.

E'NNEAGON. *s.* (εννεα and γωνια.) A figure of nine angles. See POLYGON.

ENNEAHEDRIA, in natural history, a genus of columnar, crystalliform, and double-pointed spars, composed of a trigonal column, terminated at each end by a trigonal pyramid. Of this genus there are several species, distinguished by the length or shortness of the column and pyramids, none of which give fire with steel, but all of them ferment with aquafortis. See SPAR.

ENNEANDRIA. (εννεα, nine, and ανηρ, a husband.) In botany, nine-stamened. The name of the ninth class in the Artificial System of Linnéus; comprehending such plants as bear hermaphrodite flowers with nine stamens. Also of an order in the classes monadelphia and diœcia.

ENNEAPE'TALATE COROL, in botany, a nine-petalled corol: or, a flower of nine petals: as in thea viridis, magnolia, and liriodendron.

ENNEATICAL. *a.* (εννεα.) Enneatical days, are every ninth day of a sickness; and enneatical years, every ninth year of one's life.

ENNIS, a borough of Ireland, in the county of Clare. It is large and populous, and situate on the Fergus. Lat. 52. 49 N. Lon. 8. 54 W.

ENNISCORTHY, a borough of Ireland, in the county of Wexford. It has a manufacture of coarse woollen cloth, and some considerable iron works. Lat. 52. 28 N. Lon. 6. 48 W.

ENNIUS (Quintus), an ancient poet, born at Rudii, in Calabria. His stile is rough and unpolished, but his defects, which are more particularly attributed to the age in which he lived, have been fully compensated by the energy of his expressions, and the fire of his poetry. Ennius wrote in heroic verse the annals of the Roman republic, and displayed much knowledge of the world in some dramatical and satirical compositions. He died of the gout, contracted by his frequent intoxication, about 169 years before the Christian era, in the 70th year of his age. Scipio, on his death-bed, ordered his body to be buried by the side of his poetical friend. Conscious of his merit as the first epic poet of Rome, Ennius bestowed on himself the appellation of the Homer of Latium. Of all his writings, nothing now remains but fragments, happily collected from the quotations of ancient authors.

To ENNO'BLE. *v. a.* (*ennoblir*, French.) 1. To raise from commonalty to nobility (*Shakspeare*). 2. To dignify; to aggrandize; to exalt; to raise (*South*). 3. To elevate; to magnify (*Waller*). 4. To make famous or illustrious (*Bacon*).

ENNO'BLEMENT. *s.* (from *enoble.*) 1. The act of raising to the rank of nobility. 2. Exaltation; elevation; dignity (*Glanville*).

ENOCH. (חנוך, Heb. i. e. dedicated.) The son of Cain, in honour of whom

ENOCH, the first city taken notice of in

Scripture, was so called by Cain, who built it. It was situated east of Eden, Gen. iv. 17.

Enoch, the son of Jared, and father of Methuselah, was born A.M. 622. At the age of sixty-five he begat Methuselah, and lived 300 years after, and had several sons and daughters. Enoch walked with God; and after that he had lived 365 years, "he was not, for God took him." Some construe these last words, as if they intimated that Enoch died a natural death, because in reality he lived not near so long as the other patriarchs of those times; as if God, to secure him from corruption, had taken him early out of this world. But the generality of the fathers and commentators assert that he died not, but was translated out of the sight of men, as Elijah was. The apostle Paul shows very clearly that Enoch was translated, and did not see death, Heb xi. 5.

Enoch (The prophecy of), an apocryphal book, ascribed to Enoch. The apostle Jude, ver. 14, 15, cites a passage from the book of Enoch, which has very much exercised interpreters. The question is, whether the apostle took this passage out of any particular book written by Enoch, which might be extant in the first ages of the church? whether he received it by tradition? or lastly, by some particular revelation? It is thought probable, that he read it in the book ascribed to Enoch, which, though apocryphal, might contain several truths that St. Jude, who was favoured with a supernatural degree of understanding, might make use of to the edification of the faithful. The ancients greatly esteemed this work. Tertullian expresses his concern that it was not generally received. That father, on the authority of this book, deduces the original of idolatry, astrology, and unlawful arts, from the revolted angels, who married with the daughters of men. St. Augustin allows, indeed, that Enoch wrote something divine, because he is cited by St. Jude; but he says, it was not without reason that this book was not inserted in the canon, which was preserved in the temple at Jerusalem. This father sufficiently insinuates, that the authority of this book is doubtful, and that it cannot be proved that it was really written by Enoch. Indeed the account it gives of giants engendered by angels, and not by men, has manifestly the air of a fable, and the most judicious critics believe it ought not to be ascribed to Enoch.

ENODATION. *s.* (*enodatio*, Latin.) 1. The act of untying a knot. 2. Solution of a difficulty.

ENODOUS, in botany, knotless. Without knots or joints: in opposition to nodous or knotted.

ENO'RMITY. *s.* (from *enormous*.) 1. Deviation from rule; irregularity. 2. Deviation from right; depravity; corruption (*Hooker*). 3. Atrocious crime; flagitious villany (*Swift*).

ENO'RMOUS. *a.* (*enormis*, Latin.) 1. Irregular; out of rule (*Milton*). 2. Excursive; beyond the limits of a regular figure (*Newton*). 3. Disordered; confused (*Shakspeare*). 4. Wicked beyond the common measure. 5. Exceeding in bulk the common measures (*Pope*).

ENO'RMOUSLY. *ad.* Beyond measure.

ENO'RMOUSNESS. *s.* Immeasurable wickedness (*Decay of Piety*).

ENOS, the son of Seth, and father of Cainaan, was born in the year of the world 235.

ENO'UGH. *a.* plural *enow.* (ᵹenoh, Saxon.) In a sufficient measure; so as may satisfy (*Locke*).

Eno'ugh. *s.* 1. Something sufficient in greatness or excellence (*Temple*). 2. Something equal to a man's powers or faculties (*Bacon*).

Eno'ugh. *ad.* 1. In a sufficient degree; in a degree that gives satisfaction. 2. It notes a slight augmentation of the positive degree: *I am ready* enough *to quarrel.* 3. Sometimes it notes diminution: *the song is well* enough. 4. An exclamation noting fulness or satiety (*Shakspeare*).

ENO'W. The plural of *enough*.

EN PASSANT. *ad.* (Fr.) By the way.

To ENRA'GE. *v. a.* (*enrager*, French.) To irritate; to make furious (*Walsh*).

To ENRA'NGE. *v. a.* (from *range*.) To place regularly; to put in order (*Spenser*).

To ENRA'NK. *v. a.* (from *rank*.) To place in orderly ranks (*Shakspeare*).

To ENRA'PT. *v. a.* (from *rapt*.) To throw into an ecstacy; to transport with enthusiasm (*Shakspeare*).

To ENRA'PTURE. *v. a.* (from *rapture*.) To transport with pleasure; to delight highly.

To ENRA'VISH. *v. a.* (from *ravish*.) To throw into ecstacy (*Spenser*).

ENRA'VISHMENT. *s.* (from *enravish*.) Ecstacy of delight (*Glanville*).

To ENRI'CH. *v. a.* (*enricher*, French.) 1. To make wealthy; to make opulent (*Shakspeare*). 2. To fertilize; to make fruitful (*Blackmore*). 3. To store; to supply with augmentation of any thing desirable (*Raleigh*).

ENRI'CHMENT. *s.* 1. Augmentation of wealth. 2. Amplification; improvement by addition (*Bacon*).

To ENRI'DGE. *v. a.* To form with longitudinal protuberances or ridges (*Shakspeare*).

To ENRI'NG *v. a.* (from *ring*.) To bind round; to encircle (*Shakspeare*).

To ENRI'PEN. *v. a.* (from *ripe*.) To ripen; to mature; to bring to perfection (*Donne*).

To ENRO'BE. *v. a.* (from *robe*.) To dress; to clothe; to habit; to invest (*Shakspeare*).

To ENRO'L. *v. a.* (*enroller*, French.) 1. To insert in a roll or register (*Sprat*). 2. To record; to leave in writing (*Milton*). 3. To involve; to inwrap (*Spenser*).

ENRO'LLER. *s.* He that enrols; he that registers.

ENRO'LMENT. *s.* Register; writing in which any thing is recorded; record (*Davies*).

EN RONDEAU, a musical term, signifying in the manner of a rondeau.

To ENRO'OT. *v. a.* To fix by the root; to implant deep (*Shakspeare*).

To ENRO'UND. *v. a.* To environ; to surround; to encircle; to enclose (*Shakspeare*).

ENS, among metaphysicians, denotes entity, being, or existence: this the schools call *ens reale*, and *ens positivum*; to distinguish it from their *ens rationis*, which is only an imaginary thing, or exists in the imagination.

Ens, among chemists, imports the power, virtue, and efficacy, which certain substances exert upon our bodies.

ENSA'MPLE. *s.* (*essempio*, Ital.) Example; pattern; subject of imitation (*Sanderson*).

To Ensa'mple. *v. a.* (from the noun.) To exemplify; to show by example (*Spenser*).

To ENSA'NGUINE. *v. a.* (*sanguis*, Lat.) To smear with gore; to suffuse with blood (*Milton*).

ENSA'TÆ. (*ensis*, a sword.) In botany, the fifth order in Linnéus's Fragments, and the sixth in the natural orders at the end of Gen. Pl. Containing some of the liliaceous plants, which have sword-shaped leaves.

To ENSCHE'DULE. *v. a.* To insert in a schedule or writing (*Shakspeare*).

To ENSCO'NCE. *v. a.* To cover as with a fort; to secure (*Shakspeare*).

To ENSE'AM. *v. a.* To sew up; to enclose by a seam (*Camden*).

To ENSE'AR. *v. a.* To cauterize; to stanch or stop with fire (*Shakspeare*).

ENSEELED, in falconry, is said of a hawk that has a thread drawn through her upper eyelid, and made fast under her beak, to take away the sight.

ENSEMBLE, a French term, sometimes used in our language; literally signifying together, or one with another: being formed from the Latin *in* and *simul*. In architecture, we say the ensemble, or *tout ensemble*, of a building; meaning the whole work, or composition, considered together, and not in parts, and sometimes, also, the relative proportion of the parts to the whole. "All those pieces of building make a fine *ensemble*."

To ENSHI'ELD. *v. a.* To shield; to cover; to protect (*Shakspeare*).

To ENSHRI'NE. *v. a.* To enclose in a chest or cabinet; to preserve as a thing sacred (*Tate*).

ENSIFORM. (*ensiformis*, *cartilago*, from *ensis*, a sword, and *forma*, resemblance.) Sword-like. A term applied to a cartilage. See Cartilago ensiformis.

Ensiform leaf. (*folium ensiforme*.) In botany, sword-shaped, or sword-form: ancipital or two-edged, tapering from the base towards the point; as in some species of ixia, gladiolus, iris, &c.

E'NSIGN. *s.* (*enseigne*, French.) 1. The flag or standard of a regiment (*Shakspeare*). 2. Any signal to assemble (*Isaiah*). 3. Badge; mark of distinction (*Waller*). 4. The officer of foot who carries the flag.

E'NSIGNBEARER. *s.* He that carries the flag; the ensign (*Sidney*).

To ENSLA'VE. *v. a.* (from *slave*.) 1. To reduce to servitude; to deprive of liberty (*Milton*). 2. To make over to another as his slave or bondman (*Locke*).

ENSLA'VEMENT. *s.* The state of servitude; slavery (*South*).

ENSLA'VER. *s.* (from *enslave*.) He that reduces others to servitude (*Swift*).

To ENSU'E. *v. a.* (*ensuivre*, Fr.) To follow; to pursue (*Davies*).

To Ensu'e. *v. n.* 1. To follow as a consequence to premises (*Hooker*). 2. To succeed in a train of events, or course of time (*Shakspeare*).

ENSU'RANCE. *s.* (from *ensure*.) 1. Exemption from hazard, obtained by the payment of a certain sum. 2. The sum paid for security.

ENSU'RANCER. *s.* (from *ensurance*.) He who undertakes to exempt from hazard (*Dryden*).

To ENSU'RE. *v. a.* (from *sure*.) 1. To ascertain; to make certain; to secure (*Swift*). 2. To exempt any thing from hazard by paying a certain sum, on condition of being reimbursed for miscarriage. 3. To promise reimbursement of any miscarriage for a certain reward stipulated (*L'Estrange*).

ENSU'RER. *s.* (from *ensure*.) One who makes contracts of ensurance.

ENTABLATURE, in architecture, is that part of an order of column which is over the capital, comprehending the architrave, frieze, and corniche. This is sometimes called the trabeation. As the grand parts, or divisions above-mentioned, vary in the different orders, it is manifest that the entablature varies also.

ENTA'IL. *s.* (from the French, *entaillé*, cut.) The estate entailed or settled, with regard to the rule of its descent. 2. The rule of descent settled for any estate. 3 Engraver's work; inlay: obsolete (*Spenser*).

To Enta'il. *v. a.* (*tailler*, to cut, French.) 1. To settle the descent of any estate, so that it cannot be by any subsequent possessor bequeathed at pleasure (*Dryden*). 2. To fix unalienably upon any person or thing (*Tillotson*). 3. To cut: obsolete (*Spenser*).

To ENTA'ME. *v. a.* To tame; to subjugate; to subdue (*Shakspeare*)

To ENTA'NGLE. *v. a.* To inwrap or insnare with something not easily extricable. 2. To lose in multiplied involutions. 3. To twist or confuse in such a manner as that a separation cannot easily be made. 4. To involve in difficulties; to embarrass; to perplex (*Clarendon*). 5. To puzzle; to bewilder. 6. To insnare by captious questions or artful talk (*Matthew*). 7. To distract with variety of cares (*Timothy*). 8. To multiply the intricacies or difficulties of a work.

ENTA'NGLEMENT. *s.* (from *entangle*.) 1. Involution of any thing intricate or adhesive. 2. Perplexity; puzzle (*More*).

ENTA'NGLER. *s.* One that entangles.

To E'NTER. *v. a.* (*entrer*, French.) 1. To go or come into any place (*Atterbury*). 2. To initiate in a business, method, or society (*Locke*). 3. To introduce or admit into any counsel (*Shakspeare*). 4. To set down in writing (*Graunt*).

To E'nter. *v. n.* 1. To come in; to go in (*Judges*). 2. To penetrate mentally; to make intellectual entrance (*Wa*[illegible]). 3. To engage

(*Addison*). 4. To be initiated in (*Mil-*

[illegible]NTERDE'AL. *s.* (*entre* and *deal.*) Reci[illegible]cal transactions: obsolete (*Spenser*).

ENTERING. *s.* (from *enter.*) Entrance; [illegible]sage into a place (*Isaiah*).

ENTERITIS. (*enteritis*, εντερῖτις, from εντερον, [illegible] intestine.) Inflammation of the intestines. It is a genus of diseases in the class pyrexiæ, and order phlegmasiæ of Cullen, and is known by the presence of pyrexia, fixed pain in the abdomen, costiveness, and vomiting.

To ENTERLA'CE. *v. a.* (*entrelasser*, Fr.) To intermix; to interweave (*Sidney*).

ENTEROCE'LE. (*enterocele*, εντεροκηλη, from εντερον, an intestine, and κηλη, a tumour.) Hernia intestinalis. Every hernia may be so called that is produced by the protrusion of an intestine, whether it be in the groin, navel, or elsewhere.

ENTERO-EPIPLOCE'LE. (*entero-opiplocele*, εντερο-επιπλοκηλη, from εντερον, an intestine, επιπλοον, the epiploon, and κηλη, a tumour.) A rupture formed by the protrusion of part of an intestine, with a portion of the epiploon.

Entero-hydroce'le. *entero-epiplocele*, ενιτρο-επιπλοκηλη, from εντερον, an intestine, ὕδωρ, water, and κηλη, a tumour.) An intestinal hernia with water in the scrotum.

ENTERO'MPHALUS. (*enteromphalus*, εντεροµφαλος, from εντερον, an intestine, and ομφαλος, the navel.) An umbilical hernia produced by the protrusion of a portion of an intestine.

ENTERO'LOGY. *s.* (εντερον and λογος.) The anatomical account of the bowels and internal parts.

ENTERORA'PHIA. (*enteroraphia*, εντεροραφη, from εντερον, an intestine, and ραφη, a suture.) The sewing together the divided edges of an intestine.

ENTERPA'RLANCE. *s.* (*entre* and *parler*, Fr.) Parley; mutual talk; conference (*Hayward*).

ENTERPLE'ADER. *s.* (*entre* and *plead.*) The discussing of a point incidentally falling out, before the principal cause can take end (*Cowley*).

E'NTERPRISE. *s.* (*entreprise*, Fr.) An undertaking of hazard; an arduous attempt (*Dryden*).

To E'nterprise. *v. a.* (from the noun.) 1. To undertake; to attempt; to essay (*Temple*). 2. To receive; to entertain: obsolete (*Spenser*).

E'NTERPRISER. *s.* A man of enterprise; one who undertakes great things (*Hayward*).

To ENTERTA'IN. *v. a.* (*entretenir*, Fr.) 1. To converse with; to talk with (*Locke*). 2. To treat at the table (*Addison*). 3. To receive hospitably (*Hebrews*). 4. To keep in one's service (*Shakspeare*). 5. To reserve in the mind (*Decay of Piety*). 6. To please; to amuse; to divert (*Addison*). 7. To admit with satisfaction (*Locke*).

ENTERTA'INER. *s.* (from *entertain.*) 1. He that keeps others in his service (*Bacon*). 2. He that treats others at his table (*Smalridge*). 3. He that pleases, diverts, or amuses.

ENTERTA'INMENT. *s.* 1. Conversation. 2. Treatment at the table; convivial provision (*Waller*). 3. Hospitable reception. 4. Reception; admission (*Tillotson*). 5. The state of being in pay as soldiers or servants (*Shakspeare*). 6. Payment of soldiers: obsolete (*Davies*). 7. Amusement; diversion (*Temple*). 8. Dramatic performance; the lower comedy.

ENTERTI'SSUED. *a.* (*entre* and *tissue.*) Interwoven or intermixed with various colours or substances (*Shakspeare*).

To ENTHRO'NE. *v. a.* (from *throne.*) 1. To place on a regal seat (*Shakspeare*). 2. To invest with sovereign authority (*Ayliffe*).

ENTHU'SIASM. *s.* (ενθουσιασμος.) 1. A vain belief of private revelation; a vain confidence of divine favour (*Locke*). 2. Heat of imagination; violence of passion. 3. Elevation of fancy; exaltation of ideas (*Dryden*).

Enthusiasm, an ecstasy of the mind, whereby it is led to think and imagine things in a sublime, surprising, yet probable manner. This is the enthusiasm felt in poetry, oratory, music, painting, sculpture, &c. In a religious sense, it implies a transport of the mind, whereby it fancies itself inspired with some revelation, impulse, &c. from heaven. Mr. Locke gives the following description of enthusiasm. "In all ages, men in whom melancholy has mixed with devotion, or whose conceit of themselves has raised them into an opinion of a great familiarity with God, and a nearer admittance to his favour than is afforded to others, have often flattered themselves with a persuasion of an immediate intercourse with the Deity, and frequent communications from the Divine Spirit. Their minds being thus prepared, whatever groundless opinion comes to settle itself strongly upon their fancies, is an illumination from the Spirit of God. And whatsoever odd action they find in themselves a strong inclination to do, that impulse is concluded to be a call or direction from heaven, and must be obeyed. It is a commission from above, and they cannot err in executing it. This I take to be properly enthusiasm, which, though arising from the conceit of a warm and overweening brain, works, when it once gets footing, more powerfully on the persuasions and actions of men than either reason or revelation, or both together; men being most forwardly obedient to the impulses they receive from themselves."

ENTHU'SIAST. *s.* (ενθουσιαστης.) 1. One who vainly imagines a private revelation; one who has a vain confidence of his intercourse with God (*Locke*). 2. One of a hot imagination, or violent passions (*Pope*). 3. One of elevated fancy, or exalted ideas (*Dryden*).

ENTHUSIA'STICAL. Enthusia'stic. *a.* (ενθουσιαστικος.) 1. Persuaded of some communication with the Deity (*Calamy*). 2. Vehemently hot in any cause. 3. Elevated in fancy; exalted in ideas (*Burnet*).

ENTHYMEME, in logic and rhetoric, an argument consisting only of two propositions, an antecedent, and a consequent deduced from it. The word is Greek ενθυμημα, formed of the verb ενθυμεισθαι, to think, conceive, a compound of εν and θυμος, mind. The enthymeme is the most simple and elegant of all argumentations; being what a man, in arguing closely, commonly makes, without attending at all to the form. Thus, that verse remaining of Ovid's tragedy, entitled Medea, contains an enthymeme; *Servare potui, perdere an possum rogas;* "I was able to save you; consequently to have destroyed you." All the beauty would have been lost, had all the propositions been expressed; the mind is displeased with a rehearsal of what is no ways necessary. Sometimes, also, the two propositions of an enthymeme are both included in a single proposition, which Aristotle calls an enthymematical sentence, and gives this instance thereof: Mortal, do not bear an immortal hatred. The whole enthymeme would be, Thou art mortal; let not, therefore, thy hatred be immortal.

To ENTI'CE. *v. a.* To allure; to attract; to draw by blandishments or hopes (*Ascham*).

ENTI'CEMENT. *s.* 1. The act or practice of alluring to ill (*Hooker*). 2. The means by which one is allured to ill; allurement; blandishment (*Taylor*).

ENTI'CER. *s.* One that allures to ill.

ENTI'CINGLY. *ad.* (from *entice.*) Charmingly; in a winning manner (*Addison*).

E'NTIERTY. *s.* (*entierté*, Fr.) The whole (*Bacon*).

ENTI'RE. *a.* (*entier*, French.) 1. Whole; undivided (*Bacon*). 2. Unbroken; complete in its parts (*Newton*). 3. Full; complete; comprising all requisites in itself (*Hooker*). 4. Sincere; hearty (*Bacon*). 5. Firm; sure; solid; fixed (*Prior*). 6. Unmingled; unallayed (*Milton*). 7. Honest; firmly adherent; faithful (*Clarendon*). 8. In full strength; with vigour unabated; with power unbroken (*Spenser*).

ENTIRE. (*integer*) In botany, applied to the stem when quite single with scarce any branches. An entire leaf, integrum folium; undivided, without any sinus or opening in the edge. An entire perianth, integrum perianthium; opposed to fissum, cloven; as in genipa.

ENTI'RELY. *ad.* 1. In the whole; without division (*Raleigh*). 2. Completely; fully (*Milton*). 3. With firm adherence; faithfully (*Spenser*).

ENTI'RENESS. *s.* 1. Totality; completeness; fulness (*Boyle*). 2. Honesty; integrity.

To ENTI'TLE. *v. a.* (*entituler*, French.) 1. To grace or dignify with a title or honourable appellation. 2. To give a title or discriminative appellation (*Hooker*). 3. To superscribe, or prefix a title (*Locke*). 4. To give a claim to any thing (*Rogers*). 5. To grant any thing as claimed by a title (*Locke*).

E'NTIFY. *s.* (*entietas*, low Latin.) 1. Something which really is; a real being (*Crashaw*). 2. A particular species of being (*Bacon*).

To ENTO'IL. *v. a.* (from *toil.*) To insnare; to entangle; to bring into toils or nets (*Bacon*).

To ENTO'MB. *v. a.* (from *tomb.*) To put into a tomb; to bury (*Denham*).

ENTOMO'LITHUS, in oryctology, a genus of class petrifactions, order animal; thus generically characterized; the body, or some part of an insect, changed into a fossile substance. Three species.

1. E. cancri Petrified crab; in whole or in part, found in various parts of Great Britain, and very generally over the globe in slate, on foliated lime-stone, entire, or in fragments, as the shell, legs, claws, &c. and of various species.

2. E. monoculi. Monoculus polyphemus. Found near Solenhoffen, in foliated lime-stone.

3. E. paradoxus. Oniscus paradoxus. Found in various parts of Great Britain, and the continent, in various kinds of lime-stone, and indurated clay or slate; loose or affixed, solitary or in numbers, entire or in parts, straight, incurved, expanded, or contracted: the head covered with a very convex, roughish, often three-parted shell, semilunar in front, grooved through its whole length, with two hemispherical or cylindrical tubercles, above on the sides; trunk cylindrical, three-lobed, covered with a laminar shell, consisting of versatile, triarcuated rings; tail thin, three-parted by three tumours.

ENTOMOLOGY. (from εντομα, insects, and λογος, a treatise or discourse.) The doctrine of insects, constituting a distinct class of zoology or natural history. An investigation into the structures, functions, manners, modes of increase, and habitations, of the innumerable tribes of animals included under this name, so that they may be scientifically compared and arranged into distinct tribes or families. It is a science that conducts us into the most extensive and most populous province of the whole empire of nature. For while mammals are, for the most part, confined to land, and fishes to water; while birds, though equally capable of assuming earth and air as their natural range, know little more of water than its mere surface; insects, in innumerable multitudes, are traced through each of these elements, as their allotted residence, and are provided with an astonishing diversity of powers to fit them for such opposite habitations.

Entomology, therefore, of all the branches of natural history, presents the widest field for investigation. The labour of the botanist is considerable, who has to store his memory with the names of many thousands of plants before he can accurately discriminate them, but it bears no proportion to that of the entomologist, for, amidst all these plants, there is, perhaps, hardly any one that does not furnish nourishment and a habitation to several insects; while many, as the oak for example, afford a retreat for some hundreds of different species. Plants, however, are far from being the only abode of insects; vast numbers reside upon the larger animals, whose juices they continually suck; while many live upon and devour others of their own order. Infinite numbers spend a part of their lives in the water; others remain there entirely: the earth swarms, and the air teems with multitudes too small for the human eye to observe, and too numerous for the imagination to conceive!

While the individuals of this class of the animal kingdom thus exceed all our powers of calculation, its varieties are also multiplied to a degree that renders a complete discrimination of them equally impossible. The different species of insects are not only incalculable, but each has its own distinct history, and exhibits manners, appetites, and modes of propagation peculiar to itself. In the larger ranks of existence, two animals that nearly resemble one another in form, will generally evince a similar history; but insects, almost entirely alike, are often found very dissimilar in their habits, and in the different changes which they undergo during their brief existence.

But although a complete history of the operations of nature in this large and populous part of her empire cannot be expected; yet, such a general picture may be given, as shall demonstrate some few of the more prominent modifications of that great vivifying principle by which she is animated, and by which she is enabled continually to pour forth into existence such immeasurable numbers of organized beings. A history of such insects, as most frequently occur, and whose manners are best known, will present to us a pleasing view of that protection which Providence affords even to the minutest of its creatures; of the means it employs for perpetuating them; and of that mysterious arrangement of nature, by which one set of living beings find subsistence by devouring another set, and by which life is continued through every part of the creation without a pause.

I. *General Scope and Study of Entomology.*

Entomology, like every other branch of natural history, claims it as its prerogative to demonstrate the existence and perfections of that Almighty Power which produced, and governs the universe. It is one chapter in the history of creation, and naturally leads every intelligent mind to the Creator; for there are no proofs of his existence more level to the apprehension of all, than those which this chapter offers to the understanding.

The manner, however, in which entomology has too frequently been studied, and the extremes into which men, according to their different capacities and tastes, have fallen, have excited a derision against the science, which a proper degree of discernment would have directed against the foibles alone of those who have thus studied it. While the systems of some naturalists contain only a dry repetition of shades, colours, and shapes of different insects, without entering into the more interesting and animated description of their manners, those of others, as injudiciously, ascribe to them functions, and a degree of intelligence of which they are incapable. By the former, the imagination is fatigued and disgusted with a constant repetition of the same images. By the romantic air of the latter, the mind is led into distrust with regard to the truth of the whole narrative, and to doubt of those facts which are well established and certain. Hence the study of entomology has been deemed by many an occupation the most useless and frivolous in which the human mind can be engaged. Hence too, from a fear of prostituting their talents, many have been deterred from contemplating the wonders displayed by nature, in a kingdom of animals the most numerous, diversified, and splendidly adorned, of any on the face of the globe; and thus have deprived themselves of views of the power and munificence of the Author of Nature, in some respects the most striking and interesting that can be presented to the mind of man.

Yet even to those who derive but little pleasure from the pursuits and studies of a liberal mind, and who feel but little satisfaction in any employment unattended with immediate profit, the researches of the entomologist are not without their use. Had the operations of the silk-worm never been examined, how could men have availed themselves of the labours of an insect that administers so profusely to our splendour and our luxuries? It was not to the unobserving that it first occurred, that the toil of the silk-worm might be converted into a considerable article of commerce, and might give rise to many arts, and afford subsistence to thousands of manufacturers. In the same manner, wax and honey enter into the articles of commerce, and add to our enjoyments. It cannot, therefore, be denied, that those naturalists were profitably employed, who first observed the industry of the bee; who brought the insect from its native woods, introduced it into our gardens, and, by domesticating it, have rendered it subservient to our pleasures.

The Chinese, whose progress in many of the arts is superior to that of any other nation, avail themselves of the labours of certain insects in procuring a rich dye, and an elegant varnish, which is provided by a certain species of winged ant. The celebrated purple dye of the ancients was the produce of a small species of shell-fish; and we are told by Pliny, that the discovery of its virtue was occasioned by a dog, who, in eating the fish, had dyed his ears with that beautiful colour. It seems probable that the ancients were capable, from the shells of insects, of communicating to their stuffs many beautiful shades of scarlet with which we are unacquainted; and it is not unlikely that we have also some rich tints of that colour which they wanted. It is certain that our finest reds are furnished by insects of which they were ignorant. Cochineal, the extensive and profitable uses of which have been long estimated, is now known universally to be an insect which is propagated with care, and in vast numbers, in the kingdom of Mexico. The kermes, or grain of scarlet, which was formerly imagined to be one of the galls or excrescences that are seen on shrubs, is now understood to be an insect, which attaches itself in that form to a species of the oak.

The medical uses of certain insects are far from being inconsiderable; and to these purposes they have long been applied, perhaps more frequently, and with better effect, than at present. The valuable purposes to which the lytta vesicatoria, or Spanish fly, has been made subservient, will alone vindicate the utility of those researches which have been made concerning this part of the animal kingdom. There are, however, other uses to which other insects have been applied, and that from the most remote antiquity, which appear of a still more singular nature. Before the times of Theophrastus and Pliny, certain kinds of them were employed in ripening the figs throughout the islands of the Archipelago; and it appears that the same practice still subsists among the present inhabitants of these islands. There are two kinds of figs cultivated around the Mediterranean; the wild, and the domestic. The former produces fruit several times in the year; and in it are deposited the eggs of insects which are soon converted into larves. It is by an artificial process of the same kind that the domestic fig is brought to maturity, which would otherwise drop from the tree in an unripe state. During the months of June and July, the peasants of these delightful climes are busily employed in collecting such of the wild figs as abound most with these insects, and in placing them near the cultivated fig, that they may deposite their eggs, and co-operate with the climate in bringing it to maturity. Similar purposes might probably be served by a judicious application of insects to fruit in more northerly climates, were we acquainted with the proper species. Those prunes, pears, and apples, which are first ripe, are commonly found penetrated by worms.

It is highly probable that the whole advantage resulting from this process of caprification, as it is called, consists in the putrescent disposition which is hereby produced, and which is always accompanied with an evolution or secretion of saccharine matter. See the article CAPRIFICATION.

But there are other inducements to the study of insects, of a nature totally different, yet not less personal: inducements, founded not on any hope of advantage to be derived from these animals, but of alleviating or preventing the numerous mischiefs they occasion. Infinite swarms of these animals annually desolate whole provinces; others attack our gardens and cultivated grounds, where they commit immeasurable devastations upon grain, vegetables, and fruit trees. Nor are their depredations confined to the fields; they enter the habitations of man, and by eating into the stoutest timber of which they are constructed, gradually reduce them to ruins. They destroy his furniture and clothing; some of them spare not even his person, tormenting it long before the period at which nature has destined it to become their legitimate prey.

There are four different species of the locust which are remarkably destructive. Almost every year, whole provinces, the most fertile in Asia and Africa, are laid waste by their depredation. In Tunis and Algiers, so numerous are the swarms of the species called grillus migratorius, that they darken the face of the sky like a thick cloud. These pernicious animals are wafted thither by the southerly winds in the month of April. In May they take their departure for the interior of the country, to propagate their young, which make their appearance in their larve state, during the month of June, when they commit vast depredations. The first columns, which pervade the country like an army, destroy every green shrub and pile of grass; and these are still succeeded by other swarms, that press upon their rear, devouring the tender branches and stalks of plants, which their forerunners may have left. This dreadful visitation, which the language of Scripture has justly described as a plague, does not terminate till the insects have passed into their winged state, when they fly off, leaving the whole surface of the earth naked and brown, as if scorched by fire.

Little inferior to the locust in its destructive powers is the phalæna graminis of Linnæus, which destroys the meadows in Sweden. There the peasants are employed in cutting deep ditches in the surface to stop the progress of the larves as they pass along. If the swarm be small, this device has the desired effect; but the numbers of these animals are often so great, that they fill up the trenches, and pass along over the dead bodies that are buried in them. The formica saccharivora is a native of the West Indies, where it pervades the plantations of the sugar-cane, entering the plants, and destroying them unmercifully while they are tender. In our own country, the turnip-fly, the butterfly, and the gooseberry worm, have long committed depredations in the fields and gardens, which no invention has hitherto been able to guard against. Watering the bushes, however, with an infusion of tobacco, has been found to possess some efficacy in the last case by killing the insect in its larva state.

Another object highly worthy the attention of the entomologist, is the means of preserving corn from the invasion of insects, after it is collected into granaries. This sort of sustenance, in almost every stage of its progress, is constantly exposed to the intrusions of these enemies of human industry. Flour, biscuit, and almost every kind of farinaceous food, even after it is barrelled up for exportation, is liable to be devoured, or rendered useless, by the depredations of the most hideous animals. The patriotism of statesmen, and their zeal for the good of mankind, could not receive a nobler or more useful direction than in holding out rewards to such as might discover the most effectual means of preventing the ravages of those animalcules, which by the most destructive activity, are continually converting large stores of provisions into so many masses of corruption.

May it not be hoped, that by a careful study of the nature of insects, some means may be discovered of preventing them from penetrating into the joists of buildings, and thereby reducing them into dust, and effecting the destruction of the most costly edifices? How often do we find wooden furniture destroyed by insects, which might otherwise have answered its purposes for ages? How many accidents are occasioned at sea by those formidable worms, whose heads are armed with hard shells, and who are hereby enabled to gnaw through the thickest planks, and make perforations under the water? The alarms they have frequently occasioned in Holland, by introducing themselves and multiplying among those wooden stakes which support their dikes, are universally known. The naturalist who should discover a mode of preventing such devastations would certainly deserve well of his country and of mankind, and could not be too highly rewarded.

The tar extracted from coal is an efficacious remedy in many cases. It not only penetrates so deeply into wood that it cannot be washed away; but is of so acrid a substance, as inevitably to destroy the grub: but the intolerable effluvia which it emits will, for ever, prevent its application in the case of household furniture.

The moth tribe makes still nearer approaches to man in the hostilities which it commits. No person is ignorant of the destructive quality of these insects to woollen cloths, and all kinds of fur and wearing apparel. The instinct of these animals, in providing a proper receptacle for their eggs, and food for their young, is astonishing, and it has been one of the chief objects of Reaumur, and other entomologists, to devise methods for preventing their depredations.

Of such vast extent are the mischiefs occasioned by the insect tribes upon the various objects of human industry, and the necessaries of life; all these, however, dwindle into nothing when we reflect on their dangerous effects upon the human body, and call to mind that thousands of them are continually entering into the lungs by breathing. During the whole of the summer months, the atmosphere teems with myriads of minute and viewless insects, and particularly in the months of July and August: and the excessive numbers that are conveyed into the stomach and lungs are probably one cause of those epidemic disorders for which this season of the year is so remarkable. In other cases these sources of evil are more obvious and apparent. What an uncomfortable life must be that of the poor Laplander at certain seasons of the year, in which the number of insects that surround him is so great, that a candle is no sooner lighted than the flame is extinguished by the multitudes that flock to it; where, after millions are destroyed, famished millions succeed, and renew the unceasing combat. Even in Britain, which is happily free from these unrelenting invaders, much inconvenience is often felt from the bug, the hornet, the wasp, the bee, and a great variety of other tribes.

Curiosity, however, is perhaps, after all, the leading stimulus of the entomologist: yet, are not objects of curiosity often nearly allied to those of utility? While we amuse ourselves with the former, we are frequently led to the discovery of the latter. Hence the origin of many of the most important discoveries in philosophy, as well as in natural history; and had mankind been deprived of this powerful incentive, the European world would have been as ignorant and barbarous at the present hour as the savages of Africa or America.

II. *History of Entomology.*

The class of insects, is by far the most numerous in the animal kingdom, the most remarkable for its effects on the objects of human industry, and perhaps the most important in the economy of nature. Very little attention, however, appears to have been bestowed on entomology by any of the writers of antiquity. Aristotle has allotted but a small portion of his works to the history of insects, and his authorities are not always to be depended upon. It is known, that his pupil Alexander furnished him with considerable sums to be employed in the various researches necessary for the compilation of his history of animals; and it is not improbable, that many persons were engaged in different parts to procure him the species he required, and to furnish him with such observations on their history as fell not within the reach of his own knowledge. But from several of the facts which he has related, we are led to suspect that these men were not altogether qualified for the task in which they were employed. The arrangement of Aristotle, moreover, is as defective as the authorities upon which his observations are founded. It consists of a long and tedious enumeration of animals, whose appearance and history correspond in certain particulars; followed by another enumeration of animals which differ from the former. Enumerations of this kind are seldom complete, and long before they can become so must prove a burden too great for the memory to retain. The histories of Pliny and Ælian are formed upon the same plan, and are possessed of similar defects. They consist of a number of observations ill arranged, and insufficiently authenticated.

During that long succession of subsequent ages, which was only distinguished by ignorance and barbarism, entomology shared the same fate as every other science: it was condemned to oblivion. After a taste for literature had begun to revive, the history of insects again attracted the notice of the curious; unhappily, however, for the growth of science, men were then devoted to the study of the ancients with a blind admiration. It was from their writings that they imagined the moderns were to derive a complete knowledge of all the secrets of nature; and Aristotle was principally consulted for the history of animals. Had Aldrovandi Gesner, and Mouffet, bestowed the same attention in studying the works of nature that they employed upon the writings of that naturalist, they would have made a much greater progress in real knowledge: but they observed nature only to observe there what they had read from Aristotle.

Yet the attempts of these early writers gave birth to the researches of others, who became more bold and successful in proportion as their reverence for antiquity was diminished. In 1668, about twelve years after Mouffet published his Theatrum Insectorum, the experiments and observations of the celebrated Redi made their appearance in Italy. His investigations were principally directed to the manner of the generation of insects, with a view to overthrow that absurd and erroneous doctrine established by the ancients, of their arising fortuitously from different bodies in a state of putrefaction. Nothing can more fully demonstrate the strength of prejudice than those elaborate treatises which Malphigi, Swammerdam, and Redi were obliged to compose, in order to combat the notion of the spontaneous generation of these animals. Notwithstanding all their efforts to prove that the smaller animals are produced in the same manner as the larger, and that the organization of the body of a mite requires the same apparatus of limbs, and the same delicate structure as that of an elephant, attempts were still made to revive the ancient error by Kirker, Bonarie, and others. And what is most mortifying to human reason, the same Redi, the declared enemy of prejudices, and the man of all others who knew best how to combat them, has, upon this very subject, fallen into a similar error. In order to produce those insects which are found upon the small excrescences of plants and trees, he found himself obliged to confer a vivifying power, a kind of soul upon those vegetables where they were found, and has laid aside the ordinary mode of generation, which in other instances he had laboured to establish.

Swammerdam was the contemporary of Redi; and, like him, possessed the courage to examine nature, and to think for himself. This naturalist made many anatomical observations upon insects, which after his death were published at Leyden, under the title of Biblia Naturæ, in 1737, and laid a foundation for future improvements in entomology. About the same period, Madame Marianne, a Dutch lady, contributed largely to bring the history of insects into request, by the beauty of her paintings and drawings. After having executed elegant drawings of several of the insects of Europe, from a singular avidity for these studies, she was prompted to cross the Atlantic, and give paintings of those in America. Having resided for several years in Surinam, she returned to Europe with exquisite drawings of many of the splendid insects of that continent, which were afterwards engraved and published in Holland, about the end of the last century.

Goedart is another of the early authors who adorned the history of insects with the labours of the pencil. He paid great attention to the metamorphoses of these animals, and has painted many of them in the several forms which they assume, from their appearance till their death. His work was originally published in German, very badly arranged; a new edition in Latin was afterwards given by Dr. Lister, in which many errors were corrected, and a fresh arrangement made out by that able naturalist, who has himself written a valuable treatise upon the intricate genus of spiders.

Some of these authors, by the extent of their labours, and others by the boldness of their genius, had convinced mankind that the ancients were far from attaining that perfect knowledge of nature which had been hitherto imagined: and they were now so far emboldened by the progress they had already made, as to confide in their own judgment and observation in examining the works of nature; whence many productions far more judicious, accurate, and philosophical, were offered to the public than had ever hitherto appeared. Among the first of these may be ranked that of our celebrated countryman Mr. Ray, who had, for the greater part of his life, assiduously examined the economy of insects. His Methodus Insectorum, which was not published till after his death in 1710, may be regarded as the most accurate and concise performance on the subject of entomology. In the meanwhile, various other authors arose who treated of this class of the animal kingdom; Albin described the insects of England, while sir Hans Sloan, Petivert, Catesby, and Frisch, detailed the history of vast numbers of exotic insects.

In this state of the science, about the year 1754, appeared M. de Reaumur, by far the most laborious and indefatigable entomologist in Europe. In almost every part of France this naturalist had correspondents stationed, to transmit him by post descriptions and specimens of every curious and rare insect that might occur. And in order to examine their instincts, their metamorphoses, and mode of generation, he inclosed vast numbers of them in a large insect-menagery, constructed with a close net, and secured below with a pavement overlaid with green turf, and planted with shrubs and different kinds of plants. It was here that this unwearied observer of nature examined the manners and economy of those insects, which he has described in a work the most voluminous that has hitherto appeared on entomology. As a writer, he is extremely diffuse, but always entertaining and instructive. The principal defects in his work, are the want of a systematic arrangement, and of the synonyms of other authors. These defects, however, were soon remedied by that excellent arrangement which the immortal author of the Systema Naturæ has introduced into entomology, as well as into every other department of natural history. In the mean time Geoffroy, Scopoli, Wotton, Harvey, Valisnieri, and many others of inferior note, turned their attention to this interesting subject; and while they endeavoured to improve upon the arrangement of the Swedish naturalist, though generally without success, nevertheless added greatly to the number of known insects. The labours of De Geer, a Swedish nobleman, and counsellor to his Swedish majesty, are particularly entitled to attention. He has not only described a great multitude of insects with accuracy, but has indulged in philosophical remarks upon their history, which possess very considerable merit. Other entomologists have given most elegant engravings of insects; among whom we may mention Roesel, Lewenhoeck, Baker, Barbut, Harris, and Drury. Some of these have improved the science by microscopical observation: the last has given excellent drawings of exotic insects, while Harris has applied himself successfully in delineating those of England.

To Fabricius we are deeply indebted for minute investigation, and accurate description; though his classification, as being chiefly derived from a variation in the mouth of insects, is too recondite for general use. Lamark, Latreille, Cuvier, and, as a very excellent monographist, Kirby, are all highly entitled to our thanks. Entomological physiology is considerably enriched by the labours of these eminent naturalists; and if the classification of the three former should not supersede that of Linnéus, it must at least be confessed to have great elegance and ingenuity.

III. *Instinctive Powers and Sensations of Insects.*

From the extraordinary instincts evinced by many insects, the whole class has been supposed by some entomologists to possess more intelligence than animals of any other kind; yet it is highly probable, that instead of more, they possess less than any animals, except the worm tribes. While various other animals are capable of some sort of education, these have but one invariable mode of operating, which no art can either alter or improve. The dog may be taught to carry; the bird to whistle a tune; fishes to obey a summons, and eat out of the hand; but those insects which may be considered as most perfectly domesticated, can by no invention be turned from their instinct. The silk-worm completes its labours, and the spider constructs its web, invariably in the same manner. An existence which continues but a single season, seems too short for the purposes of instruction. Hence insects are not only of a rank inferior to most other animals, but some of them seem more nearly allied to plants than to the classes above them. Many are attached to a single vegetable, some to a single leaf, where the period of their lives is completed in a few weeks, or perhaps a few days; and where the pleasures they enjoy, or the purposes for which they were produced, are in a great measure beyond the reach of our faculties to explore.

The external senses of insects, as far as we are enabled to judge of them, correspond with the low measure of sagacity which the Author of nature has assigned them. Of some senses they seem altogether destitute, while others they enjoy but in an imperfect manner. The organ of hearing is doubtful; spiders, and several other genera, give evident proofs of such an organ, though we know not where it resides, or in what it consists. In others, the existence of this sense is very equivocal, though it is probable they possess it. Many of them are endowed with the power of uttering sounds; as the bee, the fly, the gnat, and the beetle. The sphinx atropos squeaks when hurt, nearly as loud as a mouse; it has even the power, in certain circumstances, of uttering a plaintive note, which excites commiseration. In general, the power of uttering sounds agreeable to the feelings and necessities of animals is conferred on them for the purpose of communicating such feelings to the rest of their kind. In fishes we have been able to trace that the vocal tribes are also endowed with organs for the reception of sounds; and the same, perhaps, holds with regard to insects. For why should the individual be possessed of the power of expressing its pleasures or its pain, if all knowledge of sound be denied to its tribe? Were the sense of hearing withheld from the animals of the same class, it would crave assistance in vain; it would speak a language destined to be unintelligible to every being in nature. Experience daily convinces us of the truth of these remarks. If a bee or wasp be attacked near the hive, the usual consequence of this assault is, that the animal expresses its pain or indignation in a tone different from its ordinary hum; the complaint is immediately understood by the hive within, when the inhabitants hurry out to revenge the insult, in such numbers that the offending party seldom comes off with impunity. The same evidence of hearing is still more obviously afforded by the spider. Often his webs are of such an enormous length, that he cannot see from the one end of them to the other; often too, in watching for his prey, he conceals himself in some adjoining crevice, where he cannot see the animal that becomes ensnared in his toils. The fly, however, no sooner finds itself entangled, than it makes a buzzing noise, in order to escape; this noise is instantly heard and understood by the spider, who sallies forth from his concealment, and riots in the spoil, with all the eagerness and ferocity which distinguish the most rapacious quadrupeds.

If the sense of hearing have with difficulty been allowed to insects, naturalists have had still more difficulty in ascertaining the place or organ where that sense is situated. Many physiologists have supposed it to be placed in the antennas: since these, from their situation in the head, from their inward structure, and their capacity of motion, have been conceived most favourable for the seat of such organs. The antennas of all insects are composed of joints, varying in form, size, and number. Among those which are confined to live mostly under water, as the gyrinus, they are in general short; while such as roam at large through the air have them long and slender, as the phalenæ, ichneumons, and others. They are all hollow within, and rendered flexible by the joints, which are very visible in those of the crab; which are the best examples, because the largest belonging to this class of beings. This hollowness, it is supposed, is intended to receive the sound communicated to the extremities of the antennas, by the repercussion of the air; and to convey it, by means of the joints, from one piece to another, till it arrives at the brain, in that lessened degree of tone which is suited to the nature of the particular animal. Such is, or rather, such till very lately, was the common opinion of physiologists. It seems fatal to it, however, that spiders have no antennas, and that in others which possess them the sense of hearing is not weakened by their removal.

But, besides the sense of hearing, it seems highly probable that insects possess also that of smell. Many of them live on bodies in a state of putrefaction, around which, when exposed, they are seen immediately to collect, as though attracted by the fetid aroma: while those which feed on herbs, flowers, or fruits, seem to require a similar sense to direct them. It has hence been supposed that the palpi, or feelers, are the organs of smell in the insect tribes. These instruments are four, sometimes six in number; two of them evidently destined to the purpose of handling their food, and conveying it to the mouth. The others, which are in continual motion, and constantly applied to objects on which they alight, seem employed, like the snout of a hog, in searching for food, and examining the quality of the different kinds of sustenance by which they are supported. All this, however, should equally prove that the palpi are organs of touch rather than of sense. Other physiologists, therefore, have regarded the stigmata of insects as their olfactory organ: but the whole is uncertain; perhaps the sense is limited to the anterior pair of palpi alone.

The organs of vision among most kinds of insects are large; a circumstance which has put their sense of seeing beyond a doubt. These large eyes are commonly two in number, each frequently consisting of a congeries or assemblage of lenses (supposed by some to be perfect eyes in themselves), covered with a crustaceous transparent substance, to protect them from injury. In other insects, and especially in the spider tribe, these large or aggregate eyes are numerous; and in others again, the sense of vision consists of mere stemmata of a simple structure, placed on the top of the head, the real nature of which, however, is not clearly understood.

IV. *External Organs and Classical Characters.*

Insects have always been considered as a distinct class of the animal kingdom, though naturalists have not agreed in ascertaining its limits. The shades of nature are indeed intimately blended together; and the links by which she connects different portions of her animated offspring are often small and imperceptible. The insect tribe comprehends those small animals which are destitute of red blood, bones, and cartilages; which possess feet and antennas; are furnished either with a mouth or a trunk opening lengthwise; and which breathe by means of stigmata, or apertures upon the external parts of the body. They have obtained the name of insects from the frequent incisions by which they are apparently separated into several parts or segments: and they are generally divided by naturalists into the sections of head, thorax, abdomen, and limbs.

The Head.—This is for the most part distinct from the thorax, being attached to it only by a slender tendon, and is furnished with eyes, feelers, and antennas, which are doubtless the organs of the different senses All insects are supposed by Linnéus to be destitute of brain: but by this he can only mean a brain similar to that of larger animals. Even in their larve state insects are found to possess two distinct ganglions contained in a horny cavity; and from this point the nervous chord, which in red-blooded animals constitutes the medulla spinalis, proceeds along the abdomen, forming in its passage twelve simple ganglia, from which, and from the two ganglia forming the brain, the nerves derive their origin.

The *antennas* are organs peculiar to insects, and, according to their various forms and proportions, afford a useful character for arranging the genera of these animals. In respect to their form they are either setaceous, filiform, moniliform, clavated, capitated, fissile, pectinated, or bearded; and in their proportions, they are either longer than the body, or shorter, or of equal length.

The *feelers*, or tentacula, seem, as we have already remarked, to constitute the organs both of touch and of smell; they have two, three, and sometimes four joints. Some insects are said to have no mouth; in general, however, that organ is situated under the head, and to it the feelers are attached: in some it is placed under the breast; and in others again constitutes a beak or snout *(rostrum)* of considerable length, having an upper lip, transverse jaws, teeth, and a tongue, not unfrequently rolled up in a spire. The stemmata, or small eyes, are usually three brilliant convex spots, situated upon the crown of the head. Of the external senses we have already spoken.

2. *The Thorax.*—This is placed between the head and the abdomen, and is the part to which the fulcra or limbs are attached: immediately behind it is situated the abdomen, containing the stomach and viscera. It is divided into five segments, each pierced on the sides with small foramina for the purpose of breathing. It was long imagined, that all animals destitute of red blood lived without respiration: it has, however, been found by experiment, that this is not the case; and that, among the insect tribes, breathing is carried on, though in a different manner from what takes place among the larger animals. Insects are for this purpose all furnished with minute organs, which, in the language of naturalists, are termed stigmata; and consist of a number of small tubercles, ranged along each side of the body, each having an aperture at the top, called the spiracle, which communicates with the external atmosphere. The stigmata are commonly situated on the sides both of the thorax and abdomen; and vary in their number from eight to twelve. When the uses of these organs at first began to attract the attention of naturalists, it was imagined, that by means of them the insect only inspired, and that the air was ejected by the pores in the common manner, by perspiration. This opinion was adopted by Reaumur; but subsequent experiments have proved, that the air is both introduced into the lungs, and emitted from them, by the spiracles: if the stigmata be covered with oil, or any other viscid matter, respiration totally ceases, and the animal dies; if they be covered only on one side, the vital functions on that part are impeded, and the side becomes paralytic. Nor is it in their winged and active state alone that insects breathe. The crustaceous shell, by which the chrysalis is covered, is also provided with lateral stigmata, by which respiration is carried on during the period of their pupe state. In the breathing of insects, there is still another peculiarity; they thrive in air tainted by putrifying substances, and are capable of subsisting in phlogisticated air, the inspiration of which is so fatal to other animals.

3. *The Abdomen.*—This part, which contains the stomach, intestines or other viscera, consists of several annular segments, and, as we have just observed, is perforated with spiracles. The alimentary canal is short, destitute of the mesentery possessed by red-blooded animals, and sometimes exhibits small blind appendices, which are perhaps biliary ducts. The stomach differs considerably: in the lobster and earwig it is furnished with teeth; in some species of the grasshopper it is triple, as in ruminating animals.

4. *The Limbs of Insects.*—These consist of the tail, the legs, and the wings; and from these are obtained the most permanent and striking generic characters. The tail terminates the abdomen; and sometimes has two horns, and sometimes none: it is either simple, or armed with a forceps, a bristle, with one or more claws, or a sting.

The legs of these animals are generally six; the crabs and spiders have eight, and the scolopendra has a much greater number. They are divided into the thighs, which are attached immediately to the body; the tibia or shanks immediately below the second joint; and the tarsi, which are composed of various articulations, and either terminate in or consist of nails, or hands and claws: the hind feet receive different appellations, according as they are formed, for executing the various movements of walking, leaping, or swimming, whence they are called pedes cursorii, saltorii, natatorii.

The wings are in some subjects two, and in others four in number; and are so various in their colour, shape, and consistency, that they afford many characters for the distribution of these animals. The elytra or wing-cases are two, formed, in many, of a crustaceous substance, and for the most part moveable; they serve as a cover to the under wings, and furnish distinguishing marks to the naturalist. Under the wings of dipterous insects are placed the halters or poisers, which consist of a small stalk, terminating in a round knob or head; and are supposed to serve the purpose of balancing the animal; whence the French name as applied to them *les balanciers.*

In the Linnéan system the class of insects is divided into the following orders.

I. Coleoptera.
II. Hemiptera.
III. Lepidoptera.
IV. Neuroptera.
V. Hymenoptera.
VI. Diptera.
VII. Aptera.

Order I. or coleopterous insects, consists, as indeed the ordinal term itself indicates, of insects with crustaceous elytra or upper wings, sheathing those underneath. The genera are formed from the different shapes of the antennas. The wing-sheaths are united by a suture.

In order II. or hemipterous, the wings are half covered with crustaceous elytra, and are less hard and robust than those of the coleopterous insects, but more strong than those of the membranaceous winged insects that compose the subsequent orders. The upper wings are semi-coriaceous: they do not meet together in a longitudinal suture, as in the first order; but have part of their interior margin crossed or lapped, the one over the other along the upper part of the abdomen. The mouth and proboscis of the insects of this order are bent inwards towards the breast.

Order III. comprehending the lepidopterous insects, embraces the various tribes of moths and butterflies, whose wings, as the term lepidopterous imports, are covered with imbricated scales. These wings are four in number, and membranaceous; their body is rough, and the mouth furnished with a spiral tongue, which the insect can roll up or unfold at pleasure.

The neuropterous insects constituting order IV. comprehend all those genera which have four naked and membranaceous wings, reticulated with veins. The tail of these animals is unarmed, or has no sting, but is provided with appendices like pincers, by which the sexes are distinguished.

The insects of order V. (hymenopterous) have the tail armed with a sting in the females, but not in the males. They have four simple membranaceous wings.

Order VI. contains the dipterous insects, or such as have only two wings: they are farther distinguished, as we have already observed, by a poiser situated under each wing, the base of which is covered by a small scale, while the extremity terminates in a knob.

Order VII. comprehends the apterous insects, or such as are entirely destitute of wings in either sex. In some of these the head is distinct from the thorax, in others united to it.

Such is the classification of Linnéus. Other arrangements, however, have been made by other naturalists, which we will now glance at without dwelling upon.

The systems of Swammerdam and Ray are founded on the different changes which insects undergo, and distribute them into four great divisions, agreeably to the different forms under which they appear; Valisnieri has also distributed them into four orders, but according to their habitation; arranging together in one group, such as inhabit plants; placing in another those that live in the water; and in a third, such as conceal themselves under the earth or sand; reserving for his last division, those that inhabit the bodies of other animals. All those systems are defective, in having too few divisions of a class of animals so extremely numerous; the last, however, is liable to an imperfection of another kind; because many insects change their habitation at the moment of their metamorphosis. Some are at first aquatic, but after their transformation, are seen inhabiting the trees and plants; many of the subterraneous insects in like manner rise into the air as soon as they arrive at their winged state.

The system of Fabricius is built upon the extraordinary variety which exists in the structure of the mouth in different tribes of insects. But the distinction is not sufficiently obvious for a general classification. Other naturalists have thrown out from the province of insects many of those introduced into the apterous order of Linnéus. This has been especially done by Cuvier and Latreille, who have formed a new and an eighth order of the cancer, monoculus and oniscus tribes, under the name of CRUSTACEA, to which word the reader may turn for a particular account: while Lamarck is dissatisfied that the spider should be regarded as an insect and continued in the same class. The Linnéan arrangement is imperfect, but where shall we stop if we change it?

V. *Generation, and Transformation of Insects.*

We have already noticed the erroneous opinion which the ancients entertained concerning the generation of insects, and mentioned the efforts made by Redi and others in order to combat it: after all their researches, however, this part of our subject is far from being free of difficulty.

We must still, for the present, suppose the existence of a neuter gender among many tribes of insects. The ingenious labours of M. Huber have, indeed, completely discarded this anomaly from the apis family (see the article BEE); but there are many other families of the hymenopterous class to which this anomaly seems still to attach, and especially the formica or ant-genus.

There is another anomaly in the history of one or two tribes of insects of a nature altogether as extraordinary. The genus aphis or puceron exhibits hermaphrodites of the most perfect kind: a single animal of this tribe, though kept in the most careful manner from every other, will propagate its kind by itself; and if the offspring thus produced be preserved, it will also breed. M. Bonnet has well ascertained this fact by experiments, which he has repeated to the ninth generation.

This mode of generation, so different from that effected by the joint co-operation of the sexes, has been ascribed by naturalists to a power approximating that possessed by the vegetable tribes. The approximation, indeed, is obvious; and it is also visible in several other insect families, the females of which will continue to breed eight or nine successive generations from a single impregnation by the male.

Insects are in general oviparous, producing eggs which are gradually quickened into life, by the joint influence of the heat of the sun, and of those warm substances which constitute their nidus. Bonnet mentions some instances in the order diptera, in which the parent insect produces living young. The genus aphis exhibits a singular phænomenon also in this respect: during summer, being viviparous, but oviparous towards winter; the mode of birth being determined by the nature of the season.

The nide in which the eggs of insects are deposited is generally chosen with admirable skill; and adapted equally to the security, warmth, and subsistence of the larves that are to be reared in it. Some construct their nests in the earth with great labour: others deposite their eggs upon those plants, the leaves of which are to supply food for the nascent brood: a third kind, as various species of the musca, bury their eggs in the body of the chrysalids of other insects; upon the juices of which the young are nourished at the expence of the defenceless animal which they devour. Instinct is an unerring guide in directing each of these animals to a nide fitted for the preservation of its eggs.

The skin, the nostrils, the anus, and viscera of quadrupeds, furnish a receptacle for other insects; and here nature directs the parent animal to deposit its eggs. Instinct is the sole guide, and almost always an unerring one. The blow-fly, however, appears to be deceived by the putrid smell of the stapelia hirsuta or carrion-flower: mistaking this smell for that of putrescent meat, she deposits her eggs on the corol; and the young are no sooner quickened into life than they die for want of proper food.

The different changes of form which many insects undergo, from their first appearance as eggs, till they arrive at their perfect and winged state, constitute an important article in their history: these have been termed their metamorphoses, or transformations; and, from the very language employed to express them, the false notions which were long entertained, even by naturalists, are still discernible.

A fly, a spider, or an ant, insects of the most different kinds in outward appearance, do not differ more widely than the same insect does from itself, under the different forms of a worm, a chrysalis, and a butterfly. For what is at present a worm soon becomes a chrysalis, and this again is as suddenly changed into a winged animal. Changes apparently so instantaneously produced have been compared to the metamorphoses so renowned in ancient fable, and probably at first suggested the idea of such transformations. When an insect in so short a space appeared under a shape so different from that which it lately exhibited, mankind at first imagined that the change was real: they trusted to appearances, without giving themselves the trouble of reflecting on the improbability of the fact. This point, however, has been successfully laboured by Malphigi and Swammerdam, who, by dissecting insects a short time before the period of their transformation, observed that their first form is owing to an external covering alone, under which their different members are destined to acquire their proper size and firmness: that all the parts of a butterfly, for example, are perfectly distinct under the skin of the worm which invests them; and that under the crustaceous shell of the chrysalis they are still increasing in strength; and fast approaching to that state in which they are destined to appear, when the animal shall arrive at perfection, and be able to propagate its kind. All the parts of the insect in its perfect state are, hence, rather developed than formed by successive creations.

A silk worm, or the worm of a butterfly, which is about to enter into its chrysalis state, is observed for some time antecedently to grow languid, and to cease from gnawing those plants of which it was formerly so voracious: after having retired to a place fit for its purpose, and undergoing a few convulsive struggles, the skin which covered it, and gave it the form of a worm, bursts, and the animal within makes its appearance. At first it is soft and tender, and covered with a viscous fluid which ascends from the body: and which progressively hardens into that crustaceous shell in which all the members are again locked up, till they acquire greater firmness and stability. This viscous fluid, which is generally seen coloured and opaque in its crustaceous state, is at first transparent, and through it the wings, limbs, and antennas of the butterfly, are clearly perceptible. M. de Reaumur collected several hundreds of these worms before their transformation, and placed them together on a table, where he had many opportunities of examining them as they passed from one shape to another: it was then that he distinctly perceived all the different members of the butterfly, before the chrysalis had assumed its hard and apparently inanimate state.

After having remained for some time in this torpid state of a nymph, chrysalis, or pupe, the limbs of the animal acquire sufficient strength to perform their functions; and it employs them in breaking open the second prison. On this event all the members are set at liberty, and instantly assume that posture and arrangement which is best suited to the new functions with which they are now to be charged.

Yet all insects do not undergo the same number of transformations before they arrive at the winged state.

Some, immediately on leaving the egg, assume a form pretty nearly resembling that which they possess after their growth is completed. The whole order of aptera, which comprehends all the different kinds of spiders, come under this denomination. The viviparous insects, in like manner, appear from the first, under their most perfect form. Some kinds, without undergoing all the changes of the silk worm, or that of the common butterfly, after having grown for a certain period, deposite a tunic in which their wings were inveloped, and ascend into the air. Previous to this change, however, such insects enjoy the power of locomotion by means of their limbs, and in this state are distinguished by voracity and activity: of this description are all the different species of locusts. Flies, wasps, and bees, constitute another class, which, after leaving their vermicular form, and passing into their chrysalis state, display their limbs and wings without being capable of using them. The most complete example of transformation is displayed, as we have already observed, in the class of moths and butterflies.

One of the most wonderful circumstances in the economy of insects, is the different preparations which they make, and the expedients to which they have recourse for their preservation in their chrysalis or aurelia state. Many dig a hole in the earth, where they remain during the whole period of their inactivity. Such is the invention of all the coleopterous insects.

The gnats, on the other hand, dive into the water, where they remain till the period of their winged state arrives. Some eat their way into seeds and fruits, where they undergo the different changes previous to their entomized appearance. Many lodge themselves in animal bodies on the approach of their transformation; several of the aquatic tribes bury themselves among sand, encrusted with a glutinous substance; while the numerous race of phalenæ wrap themselves up in the leaves of trees, the bombyces, or larger kinds, constituting for themselves a silken web to protect them during that trying vicissitude of their lives.

In general, all insects provide for their security before their helpless state arrives, by retiring from their usual haunts into some sheltered retreat. It is thus that the worm of the butterfly provides for its safety, by betaking itself, while it has yet the power of motion, to the hole of a wall, or the eave of an incumbent roof. In this situation, some are suspended by a thread, which nature assists them in providing; some hang by the head, others by the opposite extremity, and many by the middle. The crustaceous covering with which they are then clothed, affords another instance of the attention paid by nature to the preservation of her offspring, during a period in which they are not able to avoid external injury by flight. Thus protected by the munificence of Providence, myriads of animals sink annually into a state of torpor so profound as appears to threaten the extinction of every vital power. At the return of spring, however, all nature seems again to quicken into life; her countless tribes awake from their torpid state, and enter upon new functions with enlarged powers.

VI. *Habitations, Foods, and Uses of Insects.*

It has been asserted by Aristotle, that every kind of quadruped and bird is inhabited by its peculiar insect; and this assertion, which has never been contradicted, seems to admit of being much extended. Salmons, cods, and most other fishes are, at certain seasons, infested with insects parasitic to them: animals of other kinds afford food and residence to other insects; and the same is the case with plants. As the same quadruped is often seen to feed upon a great many different plants; so the same plant often supports a variety of insects. The oak, in this country, affords sustenance to twenty or thirty different genera; and there are varieties of this tree in warmer climates that serve for food to a far greater number.

Plants afford the most general and copious pabulum for this division of the animal kingdom. Wherever any insect is found indigenous in a country, there will always be found in it plants accommodated to its wants. There are many insects attached uniformly to one plant; the silk worm always gives a decided preference to the mulberry, but will live and propagate, though less vigorously, upon common lettuce. The cocchineal insect is much attached to the opuntia; and by means of such attachments the animal is often known from the place where it is found to reside. Hence Linnéus has frequently given them names from the plants upon which they feed; a method often fallacious however, since, perhaps, the greater number reside indiscriminately upon several plants, and support themselves upon a variety of different vegetable foods. Some are asserted to be capable of residing in the human intestines, and of undergoing their transformations there; being ejected from the stomach in their winged state.

The most poisonous herbs afford food to insects equally with those that are salubrious: The water-hemlock, almost as poisonous a plant as any we know, is frequented by many tribes of these animals, and seems to constitute a favourite nourishment.

In the different stages of their lives, insects are distinguished by various degrees of voracity; many of them in the state of larves are most insatiable: the different species of the butterfly and silk worms are then endowed with teeth, with which they make great havock among leaves, even though of a pretty strong consistency; their stomachs being capable of dissolving these harder substances. The same animal, when a chrysalis, not only loses all appetite for food, but the instruments that were employed in comminuting it. The teeth are deposited with its first covering; and the inner coats of the stomach are voided, it is said, along with the excrements, a short while before the first transformation. After being liberated from their last state of confinement, the butterflies are still inferior in voracity and in the powers of digestion. Their food is now a thin liquid substance collected from the leaves of plants, and devoured only in small quantity

The same is the case with the different species of locusts; some of which in their larve state are the most voracious of all animals, and desolate entire provinces. It is not till they arrive at their winged and more perfect form that their depredations cease, and mankind are relieved from one of the heaviest calamities which fall upon them in sultry climates. It is by insects in their larve state that the roots of corn are perforated and devoured in more northerly countries. If the season prove cold and wet, they continue long under ground in the same state, and the crop, in the mean time, is so completely eaten away, that in some instances, scarcely a tenth stalk survives the depredation. In a more genial spring, these animals are expedited into their more perfect form; and the damage done by them is proportionably less; their destructive operations below ceasing as soon as they are enabled by their wings to rise into the air, and go in quest of sustenance in another element.

All insects, even when furnished with wings, take food in a greater or less quantity; though some, as the may-fly and gad-fly, are so short-lived, as in the opinion of one or two naturalists to require no sustenance, and to be destitute of mouths for eating. It is at least true, that the mouths of these insects have no mandibles. But to assert that they never eat, requires a more accurate examination than has hitherto taken place. The smaller and more delicate insects find, perhaps, various particles of matter floating in the air that serve for their support; the effluvia continually emitted by animal and vegetable substances in a state of putrefaction probably support many of them. We know, at least, that numerous tribes of fishes are capable of living upon earthy or other particles found floating in the purest water; and if animals of so superior a size be thus supported, there can hardly be any room to doubt that insects, many of whom are scarcely perceptible, may find abundant subsistence in the air, impregnated as it is with effluvia of various kinds.

The economical uses of insects, and their noxious effects upon the various objects of human industry, have already been considered; it only remains that we point out the purposes which they serve in the general system of nature. A class of beings by far the most numerous upon the face of the globe, and however small, taken individually, yet forming collectively a mass of organised matter, superior in bulk to any other department of the animal kingdom, could not have been created, nor can continue to be propagated, without answering some important end.

The first and most obvious use of this part of the animal kingdom, seems to consist in that large supply of provision which it affords the superior ranks of life. It is for this same purpose that the whole surface of the earth is annually covered with plants and herbage. Many, perhaps the greater part, of the larger animals are hence supported: while not a few are also sustained by devouring the flesh of these larger animal themselves. Between these two species of nourishment, however, there is a wide difference; and insects afford an aliment which seems to partake somewhat of the nature of both, and which supplies the wants of an infinite number of creatures whose constitutions are not wholly adapted to either. Many kinds of birds live upon hardly any other food. What a blank in the feathered race would ensue, were this copious source of provision shut up from that department of the animal kingdom! Fishes seem still more dependent on the supplies afforded by those numerous tribes of insects that either float upon the water, or are seen hovering over its surface. The whale, the largest of nature's animated offspring, is supported entirely by crabs and medusa worms. Among this class, therefore, an inconceivable diminution of numbers would necessarily ensue, were the food of insects denied it. Farther, many of the larger insects prey upon the smaller; all of which, as well as the different animals they support in their turn, must be unavoidably struck out of the family of nature the moment this species of support is withheld.

But besides the supply of food which insects afford to the superior animals, they have justly been deemed serviceable in the general system, by preserving the salubrity of the air. Over the whole surface of the earth, those numberless productions that enjoy either animal or vegetable life are continually falling into decay, and making room for countless successions of the same kinds. The atmosphere would hence, perhaps, soon become unfit for the supply of life, did not millions of insects continually consume the carrion, and other substances in a state of putrefaction, and purge the air of the noxious effluvia they emit. It is, perhaps, the office even of the very minute insects that escape our observation, to destroy those noxious particles with which that element is impregnated, and which at certain seasons render it pestilential. The operation of this class of animals upon putrid substances is much more considerable than a superficial examination might suggest. It has been asserted by the most judicious and discerning naturalists, that the produce of a dozen flies will consume a dead carcase in a shorter space than a hungry lion. If this be true, how inconceivable the benefits which may be produced by those prodigious numbers of insects, which in warm countries continually swarm through the air, their population regulated by infinite wisdom in proportion to their demand! For the rest, see **ZOOLOGY.**

E'NTRAILS. *s.* Without a singular. (*entrailles*, French.) 1. The intestines; the inward parts; the bowels; the guts (*Shakspeare*). 2. The internal parts (*Locke*).

To ENTRA'IL. *v. a.* (*intralciare*, Ital.) To mingle; to interweave; to diversify (*Spenser*).

E'NTRANCE. *s.* (*entrans*, French.) 1. The power of entering into a place (*South*). 2. The act of entering (*Shakspeare*). 3. The passage by which a place is entered; avenue (*Wotton*). 4. Initiation; commencement (*Locke*). 5. Intellectual ingress; knowledge (*Bacon*). 6. The act of taking possession of an office or dignity (*Hayward*). 7. The beginning of any thing (*Hakewill*).

ENTRANCE, in the sportsman's dialect, is applied to both horses and hounds.

ENTRANCE OF RACE-HORSES, the ceremony of entering them (at the place appointed) on a day previous to the races at any city, borough, or town, where the plates to be run for are advertised and given. Horses intended to run, are to be shewn and entered, paying two or three guineas entrance money (according to the custom of the place), and in general five shillings to the clerk of the course. For all plates given by his majesty, or the prince of Wales, no entrance money is paid or permitted, the clerk of the course only taking his accustomed fee.

ENTRANCE OF HOUNDS, is the introduction of young hounds to the pack, into which at a proper age they are incorporated.

To ENTRA'NCE. *v. a.* (from *trance.*) 1. To put into a trance. 2. To put into an ecstacy (*Milton*).

To ENTRA'P. *v. a.* (from *trap.*) 1. To insnare; to catch in a trap (*Spenser*). 2. To involve unexpectedly in difficulties; to entangle (*Shakspeare*). 3. To take advantage of (*Ecclus*).

To ENTRE'AT. *v. a.* (*traiter*, French.) 1. To petition; to solicit; to importune (*Genesis*). 2. To prevail upon by solicitation (*Rogers*). 3. To treat or use well or ill (*Prior*). 4. To entertain; to amuse: not used (*Shakspeare*). 5. To entertain; to receive: not used (*Spenser*).

To ENTRE'AT. *v. n.* 1. To offer a treaty or compact: not used (*Mac.*). 2. To treat; to discourse: not used (*Hakew.*). 3. To make a petition (*Shakspeare*).

ENTRE'ATANCE. *s.* Petition; entreaty; solicitation: not used (*Fairfax*).

ENTRE'ATY. *s.* (from *entreat.*) Petition; prayer; solicitation; request (*Shakspeare*).

ENTRE-DOUERO-E-MINHO, a province of Portugal, forty-five miles in length, and thirty-five in breadth. Braga is the capital.

ENTREMETS. *s.* (Fr.) Small plates set between the main dishes (*Mortimer*).

ENTRE-METS, in music, inferiour movements which are inserted, by way of relief, between the more important movements of a composition.

ENTREPAS, in the manage, a broken pace or going, and indeed properly a broken amble; that is, neither walk nor trot, but somewhat of an amble. This is the pace of such horses as have no reins or back, and go upon the shoulder, or of such as are hurt in their limbs.

ENTROCI, in oryctology. Zoophytic specimens of the isis entrocha. See HELMINTHOLITHUS.

E'NTROCUS, in oryctology. See HELMINTHOLITHUS.

ENTRO'PIUM. (*entropium*, εντροπιον, from εν, and τρεπω, to turn.) A disease of the eyelids, occasioned by the eyelashes and eyelid being inverted towards the bulb of the eye.

E'NTRY. *s.* (*entrée*, French.) 1. The passage by which any one enters a house (*Bacon*). 2. The act of entrance; ingress (*Addison*). 3. The act of taking possession of any estate. 4. The act of registering or setting down in writing (*Bacon*). 5. The act of entering publickly into any city (*Bacon*).

ENTRY, is sometimes also used to denote a duty or impost laid on commodities imported into a state, either by land or sea.

ENTRY, is also used for a writ which grants possession of lands or tenements to a person, on account of a legal right thereto.

To ENU'BILATE. *v. a.* (*e* and *nubilo*, Lat.) To clear from clouds.

To ENU'CLEATE. *v. a.* (*enucleo*, Latin.) To solve; to clear, to disentangle.

To ENVE'LOP. *v. a.* (*envelopper*, French.) 1. To inwrap; to cover. 2. To hide; to surround (*Philips*). 3. To line; to cover on the inside (*Spenser*).

ENVELO'PE. *s.* (French.) A wrapper; an outward case (*Swift*).

To ENVE'NOM. *v. a.* (from *venom.*) 1. To taint with poison; to poison (*Milton*). 2. To make odious (*Shakspeare*). 3. To enrage; to exasperate (*Dryden*).

E'NVIABLE. *a.* (from *envy.*) Deserving envy; such as may excite envy (*Carew*).

E'NVIER. *s.* (from *envy.*) One that envies another; a maligner (*Clarendon*).

E'NVIOUS. *a.* (from *envy.*) Infected with envy; pained by the excellence or happiness of another (*Sidney*).

E'NVIOUSLY. *ad.* With envy; with malignity; with ill-will (*Duppa*).

To ENVI'RON. *v. a.* (*environer*, French.) 1. To surround; to encompass (*Knolles*). 2. To involve; to envelop (*Donne*). 3. To surround in a hostile manner; to besiege; to hem in (*Shakspeare*). 4. To enclose; to invest (*Cleaveland*).

ENVI'RONS. *s.* (*environs*, French.) The neighbourhood, or neighbouring places round about the country.

E'NULA CAMPANA. (*enula*, a corruption of *henula* or Helenium, from Helene, the island where it grew.) Helenium. Common inula, or elecampane. Inula helenium; foliis amplexicaulibus ovatis rugosis subtus tomentosis, calycum squamis ovatis, of Linnéus; of the class syngenesia, and order polygamia superflua. This plant, though a native of Britain, is seldom met with in its wild state, but mostly cultivated. The root, which is the part employed medicinally, in its recent state, has a weaker and less grateful smell than when thoroughly dried, and kept for a length of time, by which it is greatly improved, its odour then approaching to that of Florentine orris. It was formerly in high estimation in dyspepsia, pulmonary affections, and uterine obstructions, but is now fallen into disuse. See INULA.

To ENU'MERATE. *v. a.* (*enumero*, Lat.) To reckon up singly; to count over distinctly; to number (*Wake*).

ENU'MERATION. *s.* (*enumeratio*, Lat.) The act of numbering or counting over (*Sprat*).

At Rome, it was usual to have an enumeration made of all the families. The first of these was under Servius Tullus, when the men amounted to 80,000. Claudius made an enumeration in the year of Christ 48, when there were seven millions of people fit to bear arms. The last enumeration was that of Vespasian.

ENUMERATION, in rhetoric, a part of peroration; in which the orator, collecting the scattered heads of what has been delivered throughout the whole, makes a brief and artful relation or recapitulation thereof.

To ENU'NCIATE. *v. a.* (*enuncio*, Latin.) To declare; to proclaim; to relate; to express.

ENU'NCIATION. *s.* (*enunciatio*, Latin.) 1. Declaration; publick attestation (*Taylor*). 2. Intelligence; information (*Hale*). 3. Expression.

ENU'NCIATIVE. *a.* (from *enunciate.*) Declarative; expressive (*Ayliffe*).

ENU'NCIATIVELY. *ad.* Declaratively.

E'NVOY. *s.* (*envoye*, French.) 1. A publick minister sent from one power to another (*Denham*). 2. A publick messenger, in dignity below an ambassador. 3. A messenger (*Blackmore*).

ENURE'SIS. (*enuresis*, ενουρησις, from ενουρεω, to make water.) An involuntary flow of urine. A genus of diseases in the class locales, and order apocenoses of Cullen, containing two species: 1. Enuresis atonica, the sphincter of the bladder having lost its tone from some previous disease. 2. Enuresis ab irratione, vel compressione vesicæ, from an irritation or compression of the bladder.

To E'NVY. *v. a.* (*envier*, French.) 1. To hate another for excellence, happiness, or success (*Collier*). 2. To grieve at any qualities of excellence in another (*Swift*). 3. To grudge; to impart unwillingly (*Dryden*).

To ENVY. *v. n.* To feel envy; to feel pain at the sight of excellence or felicity (*Taylor*).

E'NVY. *s.* (from the verb.) 1. Pain felt and malignity conceived at the sight of excellence or happiness (*Pope*). 2. Rivalry; competition (*Dryden*). 3. Malice; malignity (*Shakspeare*). 4. Publick odium; ill repute (*Bacon*).

The word envy is commonly used in one or other of the four senses given above: but it may be proper to describe, a little more particularly, the nature of this passion. Envy is a painful sensation, excited by the view of something desirable in the state and situation of another, which self-love wishes to appropriate. To envy, is to repine at the good conferred upon another, or possessed by him. Thus it is a perfect contrast to the sympathy which rejoices at their welfare. Envy entertains a degree of sorrow that the good contemplated should escape ourselves, and of anger that it should fall to the share of another. The inordinate self-love which excites to envy, naturally induces the envious person to imagine that he is more deserving than the party who has been favoured. He contemplates his own supposed merit, in opposition to the supposed demerit of the more happy object, until he becomes fully convinced in his own prejudiced judgment of the injustice of the distribution; and feels a spirit of resentment arising against the possessor, and every cause of his enjoyment.

Thus is envy that species of malevolence, which is inspired by the conjoined influence of pride, sorrow, and anger.

Envy is denominated a passion, together with many other of the malevolent affections; partly because it may be very strongly excited by particular incidents, and partly in consequence of that singular law of usage, which assigns the word affections to the benevolent feelings, and passions to the powerful influence of vicious dispositions. (*Cogan*, p. 161.)

To ENWHEEL. *v. a.* (from *wheel.*) To encompass; to encircle (*Shakspeare*).

To ENWO'MB. *v. a.* (from *womb.*) 1. To make pregnant (*Spenser*). 2. To bury; to hide as in a womb (*Donne*).

E. O. a game of chance, so denominated from the two letters of the alphabet employed to distinguish the two sets of niches that bound the circumference of the table.

The form of an E. O. table is circular, and its diameter commonly about four feet, though this last is not a point of essential consequence. The table is divided into three concentric circles. The outermost of these forms a counter, or depôt for the stakes, and is subdivided into forty niches or interstices, of which twenty are marked with the letter E, and the remaining twenty with the letter O; and on these letters, or subdivisions, each adventurer places money according to his inclination. The middle circle of the table consists of a gallery, or rolling place for the ball; and this and the exterior circle are stationary. The innermost circle moves upon an axis or pivot, and is turned about with handles, whilst the ball is set in motion round the gallery. The lodging of the ball in any of the niches, distinguished by the two letters employed, determines the wager.

The proprietors of these tables have two bar-holes, and are obliged to take all bets that are offered, either for E or O: and if the ball fall into either of the bar-holes, they win all the bets upon the opposite letter, and do not pay to that in which it falls; an advantage in the proportion of two to forty or five per cent. in their favour.

EOLIAN, or **Æolian**, one of the five chief modes in the Greek music. See Mode.

EOLIPILE. See Æolipile.

EOLUS'S HARP. See Æolus's harp.

EOSTRE, in mythology, a Saxon goddess, to whom they sacrificed in the month of April, called the month of Eostra; and thence the name Easter, which the Saxons retained after their conversion to Christianity, applying it to the festival celebrated in commemoration of our Saviour's resurrection.

EPACRIS, in botany, a genus of the class pentandria, order monogynia Calyx five-parted; corol funnel-form, villous; nectariferous scales growing to the germ; capsule five-celled, five-valved; the partitions from the middle of the valves; seeds minute, numerous. Four species: natives of Australasia, herbaceous; shrubby; arboreous. See Botany, Plate LXXXIX.

Of this tribe, one of the most beautiful is e. grandiflora, crimson epacris, with shrubby woolly stem; ever-green alternate leaves, nearly heart-shaped; flowers axillary, solitary, pendulous, scentless. Peduncles short, recurved. Corol tubular. It may be propagated both by seeds and layers.

EPACTS, in chronology, the excesses of the solar month above the lunar synodical month, and of the solar year above the lunar year of twelve synodical months; or of several solar months above as many synodical months, and several solar years above as many dozen of synodical months. The epacts, then, are either annual or menstrual. Menstrual epacts are the excesses of the civil or calendar month above the lunar month. Suppose, *e. g.* it were new moon on the first day of January; since the lunar month is 29 days 12 h. 44′ 3″, and the month of January contains 31 days, the menstrual epact is 1 day 11 h. 15′ 57″. Annual epacts are the excesses of the solar year above lunar. Hence, as the Julian solar year is 365 days 6 h. and the Julian lunar year 354 days 8 h. 48′ 38″, the annual epact will be 10 days 21 h. 11′ 22″; that is, nearly 11 days. Consequently the epact of 2 years is 22 days; of 3 years, 33 days; or rather 3, since 30 days make an embolismic or intercalary month. Thus the epact of 4 years is 14 days, and so of the rest; and thus, every 19th year, the epact becomes 30 or 0; consequently the 20th year the epact is 11 again; and so the cycle of epacts expires with the golden number, or lunar cycle of 19 years begins with the same; these are Julian epacts: the Gregorian depend upon the same principles, accounting only for the difference of the respective years.

As the new moons are the same, that is, as they fall on the same day every 19 years, so the difference between the lunar and solar years is the same every 19 years. And because the said difference is always to be added to the lunar year, in order to adjust or make it equal to the solar year; hence the said difference respectively belonging to each year of the moon's cycle is called the epact of the said year, that is, the number to be added to the same year, to make it equal to the solar year; the word being formed from the Greek *επαγω*, *induco*, *intercalo*.

Rule to find the Gregorian Epact.

The difference between the Julian and Gregorian years being equal to the difference between the solar and lunar year, or 11 days, therefore the Gregorian Epact for any year is the same with the Julian Epact for the preceding year; and hence the Gregorian Epact will be found, by subtracting 1 from the golden number, multiplying the remainder by 11, and rejecting the 30's. This rule will serve till the year 1900; but after that year, the Gregorian Epact will be found by this rule: Divide the centuries of the given year by 4; multiply the remainder by 17; then to this product add 43 times the quotient, and also the number 86, and divide the whole sum by 25, reserving the quotient: next multiply the golden number by 11, and from the product subtract the reserved quotient, so shall the remainder, afterrejecting all the 30's contained in it, be the epact sought.

The following table contains the golden numbers, with their corresponding epacts, till the year 1900.

Table of Gregorian Epacts.

Golden Numb.	Epacts.	Golden Numb.	Epacts.	Golden Numb.	Epacts.
I	0	VIII	17	XV	4
II	11	IX	28	XVI	15
III	22	X	9	XVII	26
IV	3	XI	20	XVIII	7
V	14	XII	1	XIX	18
VI	25	XIII	12	I	0
VII	6	XIV	23		

EPAMINONDAS, a famous Theban descended from the ancient kings of Bœotia. His father's name was Polymnus. He has been celebrated for his private virtues and military accomplishments. His love of truth was so great that he never disgraced himself by a lie. He formed a most sacred and inviolable friendship with Pelopidas, whose life he saved in a battle. By his advice Pelopidas delivered Thebes from the power of the Lacedemon. This was the signal of war. Epaminondas was set at the head of the Theban armies, and defeated the Spartans at the celebrated battle of Leuctra, about 371 years B.C. Epaminondas made a proper use of this victorious campaign, and entered the territories of Lacedæmon with 50,000 men. Here he gained many partizans; but at his return to Thebes he was seized as a traitor for violating the laws of his country. In the midst of his success he neglected the law which forbade any citizen to retain the supreme power more than one month, and all his eminent services seemed unable to redeem him from death. He paid implicit obedience to the laws, and only begged of his judges that it might be inscribed on his tomb that he had suffered death for saving his country from ruin. This animated reproach was felt; he was pardoned, and invested again with the sovereign power. He was successful in a war in Thessaly, and assisted the Eleans against the Lacedæmonians. The hostile armies met near Mantinea, and while Epaminondas was bravely fighting, he received a fatal wound in the breast, and expired exclaiming, that he died unconquered, when he heard that the Bœotians obtained the victory, in the 48th year of his age, 363 years before Christ. The Thebans severely lamented his death; in him their power was extinguished, for only during his life they had enjoyed freedom and independence among the Grecian states.

EPANORTHOSUS, in rhetoric, a figure by which a person corrects, or ingeniously revokes, what he just before alleged, as being too weakly expressed, in order to add something stronger, and more conformable to the passion with which he is agitated.

EPARER, a word used in the manage to signify the flinging of a horse, or his striking or yerking out with his hind-legs. In caprioles a horse must yerk out behind with all his force, but in balotades he strikes but half out, and in croupades he does not strike out his hind-legs at all. All such yerking horses are deemed restive.

EPAULE, in fortification, denotes the shoulder of a bastion, or the place where its face and flank meet, and form the angle called the angle of the shoulder.

EPAULEMENT, in fortification, a work raised to cover sidewise, is either of earth, gabions, or fascines, loaded with earth. The epaulements of the places of arms for the cavalry, at the entrance of the trenches, are generally of fascines mixed with earth.

Epaulement also denotes a mass of earth, called likewise a square orillon from its figure, raised to cover the cannon of a casement, and faced with a wall. It is likewise used for any work thrown up to defend the flank of a post, or other place.

EPAULETTES, shoulder knots. Among the French, all the degrees of rank, from a cadet to a general officer, were so minutely marked out by the epaulette, that a common centinel might instantly know what officer approached his station, and could pay the prescribed honours without hesitation or mistake.

This is not the case in our service. Some few alterations have lately been made in those ornaments; but they are so partial, and confined to the upper ranks only, that it is impossible to distinguish the youngest ensign from the oldest captain by his epaulette, or by any other part of his uniform. When Highland or fusileer regiments are mixed with the line, every sentinel is still more perplexed, as all the officers belonging to those corps indiscriminately wear two epaulettes made of fringe and bullion of the same quality.

Epaulettes have been introduced into the navy during the present war. The following are the gradations of rank as distinguished by epaulettes. Masters and commanders have one epaulette on the left shoulder. Post-captains under three years, one epaulette on the right shoulder. And after having been post three years, two epaulettes. Rear-admirals have one star on the strap of the epaulette, vice-admirals two stars, and admirals three stars.

EPENDYTES, among the Greeks, a garment worn under the pallium, but above the inner coat.

EPENTHESIS, in grammar, the interposition or insertion of a letter or syllable in the middle of a word; as alituum for alitum; relligio for religio; induperator for imperator.

EPERNAY, an ancient town of France, in the department of Marne. It is noted for exquisite wines. Lat. 49. 5 N. Lon. 4. 0 E.

EPHA, or **Ephah**, in Jewish antiquity, a measure for things dry, rather exceeding a Winchester bushel; being nearly 1·0961 in terms of the bushel.

EPHEBŒUM, the place where the Athenian Ephebi, or young men arrived at 18 years of age, exercised.

EPHEDRA. In botany, a genus of the class diœcia, order monadelphia. Male: calyx of the ament two-cleft; corolless; stamens seven; anthers four, inferior; three superior. Fem.: calyx two-parted, five-fold: corolless; pistils two; seeds two covered with the berried calyx. Two species.

1. E. distachya. Sea-grape. A native of the south of Europe, with opposite peduncles, and aments in pairs.

2. E. monostachya. Horse-tail. A native of Siberia; with many peduncles and solitary aments.

EPHELIS. (*ephelis*, εφηλις; from επι, and ηλιος, the sun.) A broad, solitary, or aggregated spot, attacking most commonly the face, back of the hand, and breast, from exposure to the sun.

EPHEMERA, (*ephemera*, εφημερα; from επι, upon, and ημερα, a day. A fever which begins, is perfectly formed, and runs through its course, in the space of twelve hours.

Ephemera. Day-fly. May-fly. In zoology, a genus of the class insecta, order neuroptera. Mouth without mandibles; feelers four, very short, filiform; antennas short, filiform: above the eyes are two or three large stemmata; wings erect, the lower ones much shorter; tail terminating in long bristles or hairs. These short-lived animals are found every where about waters in the summer, and in their perfect state seldom live above a day, some of them not an hour, during which time they perform all the functions of life and answer all the purposes of nature. The larve lives under water, and is eagerly sought after by trout and other fishes; is six-footed, active, and furnished with a tail and six lateral fins or gills: the pupe resembles the larve, except in having rudiments of future wings. Entomologists have reckoned up thirty-one distinct species: some of which have the tail with three hairs or bristles; and others with only two. In other respects their chief difference consists in the colour of their wings and body; the former being white, black spotted, reticulate, immaculate; the latter being brown black, yellow or yellowish. Of these, about eight speccies are found in the atmosphere of our own country. It may be sufficient to instance the e. vulgata (common may-fly), with wings reticulate and spotted with brown; body yellowish spotted with black. These are extremely frequent over our own rivers during summer: but in some countries throng so considerably as to darken the atmosphere; and in Carniola appear in such prodigious swarms that the peasants collect them by cart-loads to manure their land with, so largely do they cover the banks of the rivers upon the cessation of their very transient existence. The females are extremely prolific; within the short term of its being each will generally lay seven or eight hundred eggs over the water, which are precipitated to the bottom, notwithstanding their apparent levity, by their own specific gravitation; yet the larves proceeding from them are devoured in immense quantities by fishes, who often watch their motions narrowly for this very purpose. See Nat. Hist. Pl. XC.

EPHE'MERAL. Ephe'meric. *a.* Diurnal; beginning and ending in a day.

EPHEMERIDES, in astronomy, tables calculated by astronomers, showing the present state of the heavens for every day at noon: that is, the places wherein all the planets are found at that time. It is from these tables that the eclipses, conjunctions, and aspects of the planets, are determined; horoscopes or celestial schemes constructed, &c. The astronomers of most nations publish ephemerides: of these the most celebrated are the Ephemerides of Bologna; the Nautical Almanac, published in England, under the superintendence of Dr. Maskelyne, the worthy and excellent astronomer royal; and the Connoissance des Temps, published in France, by M. J. Lalande, Delambre, and others.

EPHE'MERIST. *s.* (from *ephemeris*) One who consults the planets; one who studies or practises astrology (*Howel*).

EPHE'MERON-WORM. *s.* A sort of worm that lives but a day. See Ephemera.

EPHESIA, in mythology, a feast instituted at Ephesus, in honour of Diana.

EPHE'SIANS (Epistle to), was written during St. Paul's imprisonment at Rome, about the spring of the year 61.

Ephesus was the chief city of the Proconsular Asia, which was a part of what was called the Lesser Asia. (See the next article.) It was particularly famous for the temple of Diana, and its inhabitants were remarkably addicted to idolatry and magic, and noted for their lasciviousness and luxury. Paul first preached the gospel among them in the year 54. He came again to Ephesus in the following year, and did not leave the Ephesians till the year 57. In his return to Achaia in 58, he sent for the elders of the Ephesian church to Miletus, and bade them his last farewel.

The former part of this epistle is doctrinal; the latter part practical. The general design of it was to establish the Ephesians in the faith, and to this end, to give them more exalted views of the eternal love of God, and of the glorious excellence and dignity of Christ: to shew that they were saved by grace, and that howsoever wretched they were once, the Gentiles now have equal privileges with the Jews: to encourage them by declaring with what stedfastness he suffered for the truth, and with what earnestness he prayed for their establishment and perseverence in it: and finally, in consequence of their profession, to engage them to the practice of those duties, that became their character as Christians.

EPHESUS, a very ancient town of that part of Natolia, in Asiatic Turkey, which was formerly called Ionia. It is now called Ajasalouc, and many remains of its ancient magnificence and splendour are still to be seen. The fortress by which it is defended appears to have been the work of some of the Greek emperors. St. Paul's epistle to the Ephesians was written to the christian community of this city. Its situation is near a gulph of the same name, and it has a harbour. It is 40 miles S. of Smyrna. Lat. 37. 48 N. Lon. 27. 33 E.

Mr. Macgill, a recent traveller, informs us that this once famous city is now one of the most wretched villages even in the Turkish empire. The beautiful plains in which it stands are totally uncultivated; and the river, being allowed to choke itself up by the deposit of mud and sand, so frequently overflows its banks, that these plains are reduced to the state of perfect marshes. The ancient port was about a mile distant from the present bed of the river. The temple of Diana covers with its ruins a great space of the amphitheatre. Its huge pillars, broken and scattered, numberless arches, pedestals, architraves, pieces of sculpture, are all that remain of it; but they give mighty indications of its former grandeur.

EPHETÆ, magistrates at Athens first instituted by Demophoon, the son of Theseus. They were reduced to the number of 51 by Draco, who, according to some, first established them. They were superior to the Areopagites, and their privileges were great and numerous. Solon, however, lessened their power.

EPHIALTES. (εφιαλτης, from εφαλλομαι, to leap upon.) The incubus, or night-mare: so called because it used to be thought that a spectre or dæmon leaped upon the chest.

EPHIDROSIS. (*ephidrosis*, επιδρωσις; from εφιδροω, to perspire.) Sudatio. Mador. A violent and morbid perspiration. A genus of disease in the class locales, and order apocenoses of Cullen.

EPHIELIS, in botany, a genus of the octandria monogynia class and order. Essential character: calyx five-parted; petals five, with claws; nectary ten scales, two to each petal; capsule oblong, one-celled, two-valved, two-seeded. There is but one species; viz. e. guianensis: this is a lofty tree, growing in the forests of Guiana, where it flowers in the month of October.

EPHIPPIUM. (*ephippium*, εφιππιον, a saddle, which it is thought to resemble.) See SELLA TURCICA.

EPHOD. (אפד, derived from אפד, *aphad*, to clothe.) A sacerdotal garment, in use among the ancient Jews, supposed to have been a kind of linen alb, or surplice, wore by persons of distinction, of various characters; the same with what the Latins call super-humerale.

It is very hard to say precisely what the ephod was; and there is room enough for the interpreters to be divided about it. The only point they are agreed upon is, that it was an upper garment worn over all the rest, immediately under the pectoral or breast-plate. Some hold it had sleeves, others deny it. The generality agree, that it was very short, though some maintain that it hung down to the feet behind.

EPHORI, powerful magistrates at Sparta, who were first created by Lycurgus; or, according to some, by Theopompus, B.C. 760. They were five in number. Like censors, they could check the authority of the kings, and even imprison them, if guilty of irregularities. They were much the same as the tribunes of the people at Rome.

EPHRATA, or DUNKERSTOWN, a town of Pensylvania, in the county of Lancaster, 60 miles W. of Philadelphia. It is the principal settlement of the sect called Dunkers in America. See DUNKERS.

EPHRELIS. In botany, a genus of the class octandria, order monogynia. Calyx five-parted; corol five-petalled; nectaries ten-scales, two inserted into each petal; capsule one-celled, two-valved, two-seeded. One species only; a Guiana tree about fifty feet high.

EPHYDOR, an officer in the Athenian courts of justice, who was to provide the plaintiff and defendant with equal water hourglasses. When the glass was run out, they were not permitted to speak any farther; and, therefore, we find them very careful not to lose or mispend one drop of their water. Whilst the laws quoted by them were reciting, or if any other business happened to intervene, they gave orders that the glass should be stopped.

EPIBATŒ, marines aboard the Greek ships of war.

EPIBATERIUM. In botany, a genus of the class monœcia, order hexandria. Calyx double, the outer six-leaved; inner three-leaved and larger; petals six, three of them outer, and between the calycine leaflets; three inner; drupes three, nearly globular, mucimate with the three permanent styles, including a kidney-form nut. One species; a native of the Polynesian isles.

EPIC, or HEROIC, POEM, a poem expressed in narration, formed upon a story partly real and partly feigned; representing, in a sublime style, some signal and fortunate action, distinguished by a variety of great events, to form the morals, and affect the mind with the love of heroic virtue. We may distinguish three parts of the definition, namely, the matter, the form, and the end. The matter includes the action of the fable, under which are ranged the incidents, episodes, characters, morals, and machinery. The form comprehends the way or manner of the narration, whether by the poet himself, or by any persons introduced, whose discourses are related: to this branch likewise belong the moving of the passions, the descriptions, discourses, sentiments, thoughts, style, and versification; and besides these, the similies, tropes, figures, and, in short, all the ornaments and decorations of the poem. The end is to improve our morals and increase our virtue.

An epic poem, according to Bossu, is a discourse invented with art, to form the manners, by instructions disguised under the allegory of an important action related in verse, in a probable, entertaining, and surprising manner.

The epic poem is distinguished from comedy, in that the action of the latter is not important, nor is related by the poet, but acted by the persons introduced for that purpose; which circumstance, likewise, distinguishes it from tragedy. It differs also from tragedy in the event, or conclusion; which, in the latter, is generally unfortunate; but never so in the former.

Nor is it a philosophical poem, as that of Lucretius, or the Creation of sir R. Blackmore; nor a treatise of agriculture, or the like, as the Georgics of Virgil; those poems not being intended to form the manners; beside, that the instructions they contain are naked, simple, and direct, without any disguise or allegory. which second circumstance likewise distinguishes it from a treatise of morality, written in verse; or a simple history in verse, as the Pharsalia of Lucan, the Punic War of Silius, or the Civil Wars of Sam. Daniel; add, that its being confined to one important action, distinguishes it from a poem which relates all the actions of a person's life, as the Theseid and Achilleid of Statius, which are what we properly call *heroic poems*.

The nature of the epic poem is finely drawn by the great critic abovementioned: the epic poets, says father Bossu, have done that with regard to morality which the ancient heathen divines did with regard to divinity. The too great diversity of divine actions and perfections, so very disproportionate to our comprehension; obliged the latter to divide a single idea of a simple essence, God, into several persons, to whom they attributed several names, Jupiter, Juno, Neptune, &c. And, on the contrary, the nature of moral philosophy, which never prescribes rules for particular things, led the poets to collect into one single idea, or into one and the same person, and one apparently singular action, whatever of that kind was found in different persons and different actions.

Thus Aristotle, Ου στοχαζεται η ποιησις ονοματα, &c. Poetry, says he, teaches moral philosophy, not by relating only, in the manner of an historian, what Alcibiades, for instance, did or suffered; but by proposing what some person, named as the poet thinks fit, would probably or necessarily have done on the like occasion: and thus it is that he shews either the unhappy consequences usually attending imprudent schemes or ill actions; or the reward of good actions, and the satisfaction resulting from a design laid in virtue, and conducted with prudence. So that in the epic poem, according to Aristotle's sentiment, the persons and actions, however named, are all to be feigned, allegorical and universal, not historical and singular.

But the poets, thus taking on them the office of moral philosophers, did not cease to be divines. On the contrary, their morality itself frequently obliges them to introduce the deity in their works; as the knowledge, fear, and love of God, are the first and most solid foundations of all morality. The presence of the divinity, and the share so august a personage was supposed to have in the action, obliged the poet to make the action great and important, and to have it transacted by kings and princes. The same likewise obliged them to think and speak in a manner elevated above the common pitch of men, and equal, in some measure, to the dignity of the divine persons introduced. To which end serves the poetical and figurative language, with the majesty of heroic verse. Add, that as so much of the divine and miraculous might ruin the probability, they were hereby obliged to have recourse to several rules to maintain the same.

Thus much the poets were driven to by the substance of the things they had chosen for the matter of their poems and instructions. The manner of delivering them usefully and methodically obliged them to several other necessary rules.

The epic poem is intended more for the manners and habits, than for the passions. These latter rise all at once, and their violence is but of short duration; but the habits are more calm and impressed, or quitted more leisurely.

Consequently, the epic action could not be included in the space of a day, as that of the theatrical. A longer time was necessary than is required for tragedy, which is altogether for the passions.

"The epic poem (says Blair in his Lectures) is allowed to be, of all poetical works, the most dignified, and, at the same time, the most difficult in execution. To contrive a story which shall please and interest all readers, by being at once entertaining, important, and instructive; to fill it with suitable incidents; to enliven it with a variety of characters and of descriptions; and throughout a long work, to maintain that propriety of sentiment, and that elevation of style, which the epic character requires, is unquestionably the highest effort of poetical genius.

"The action or subject of the epic poem must be great and interesting. Without greatness it would not have sufficient importance either to fix our attention or to justify the magnificent apparatus which the poet bestows upon it. This is so evidently requisite as not to require illustration; and, indeed, hardly any who have attempted epic poetry have failed in choosing some subject sufficiently important, either by the nature of the action, or by the fame of the personages concerned in it. The fame of Homer's heroes, and the consequences of dissension between the greatest of them, is a subject important in itself, and must have appeared particularly so to his countrymen, who boasted their descent from those heroes. The subject of the Æneid is still greater than that of the Iliad, as it is the foundation of the most powerful empire that ever was established upon this globe; an event of much greater importance than the destruction of a city, or the anger of a semi-barbarous warrior. But the poems of Homer and Virgil fall in this respect infinitely short of that of Milton. Before the greatness displayed in Paradise Lost, Johnson has well observed that all other greatness shrinks away. The subject of the English poet is not the destruction of a city, the conduct of a colony, or the foundation of an empire: it is the fate of worlds, the revolutions of heaven and earth; rebellion against the Supreme King, raised by the highest order of created beings; the overthrow of their host, and the punishment of their crime; the creation of a new race of reasonable creatures; their original happiness and innocence, their forfeiture of immortality, and their restoration to hope and peace.'

An epic poem, however, is defective, if its action be not interesting as well as great; for a narrative of mere valour may be so constructed as to prove cold and tiresome. "Much (says Blair) will depend on the happy choice of some subject, which shall by its nature interest the public: as when the poet selects for his hero one who is the founder, or the deliverer, or the favourite of his nation, or when he writes achievements that have been highly celebrated, or have been connected with important consequences to any public cause. Most of the great epic poems are abundantly fortunate in this respect, and must have been very interesting to those ages in which they were composed." The subject of the Paradise Lost, as it is infinitely greater, must likewise be considered as more universally interesting than that of any other poem. "We all feel the effects of Adam's transgression; we all sin like him, and like him must bewail our offences. We have restless enemies in the fallen angels, and in the blessed spirits we have guardians and friends; in the redemption of mankind we hope to be included; in the description of heaven and hell we are surely interested, as we are all to reside hereafter either in the regions of horror or bliss."

"The chief circumstance which renders an epic poem interesting, and which tends to interest not one age or country alone, but all readers, is the skilful conduct of the author in the management of his subject. His plan must comprehend many affecting incidents. He may sometimes be awful and august; he must often be tender and pathetic; he must give us gentle and pleasing scenes of love, friendship, and affection. The more that an epic poem abounds with situations which awaken the feelings of humanity, it is the more interesting. In this respect perhaps no epic poets have been so happy as Virgil and Tasso. The plan of the Paradise Lost comprises neither human actions nor human manners. The man and woman who act and suffer, are in a state which no man or woman can ever know. The reader finds no transaction in which he can be engaged; beholds no condition in which he can by any effort of imagination place himself; he has therefore little natural curiosity or sympathy."

A question has been moved, Whether the nature of the epic poem does not require that the hero should be ultimately successful? To this question Johnson replies, that "there is no reason why the hero should not be unfortunate, except established practice, since success and virtue do not necessarily go together." Most critics, however, are of a different opinion, and hold success to be, if not the necessary, at least the most proper, issue of an epic poem. An unhappy conclusion depresses the mind, and is opposite to the elevating emotions which belong to this species of poetry. Terror and compassion are the proper subjects of tragedy; but as the epic is of larger extent, it were too much, if, after the difficulties and troubles which commonly abound in the progress of the poem, the author should bring them all at last to an unfortunate conclusion. We know not that any author of name has held this course except Lucan; for in the Paradise Lost, as Adam's deceiver is at last crushed, and he himself restored to the favour of his Maker, Milton's hero must be considered as finally successful.

EPICEDIUM, or EPICEDION, in the Greek and Latin poetry, a poem, on the death of a person; the word is formed of ἐπι, upon, and κηδος, funeral. We have two beautiful epicedions in Virgil, that of Euryalus and that of Pallas.

EPICHARMUS, a poet and Pythagorean philosopher of Sicily, who introduced comedy at Syracuse, in the reign of Hiero. His compositions were imitated by Plautus. He wrote some treatises upon philosophy and medicine. According to Aristotle and Pliny, he added the two letters χ and ϑ to the Greek alphabet. He flourished about 440 years before Christ, and died in the 90th year of his age. (*Horat. Diog.* &c.)

EPICHYRUM, in botany, a genus of the class cryptogamia, order fungi. Fungus rounded, concave; seeds globular, tailless, attached to a branched filament creeping within. One species only.

EPICLEROS, among the Athenians, a daughter who had no brothers.

EPICŒNE, in grammar, a term applied to nouns, which, under the same gender and termination, mark indifferently the male and female species. Such in Latin is *aquila*, *vespertilio*, &c. which signify equally a male or female eagle or bat. Grammarians distinguish between *epicœne* and *common*. A noun is said to be common of two kinds, when it may be joined either with a masculine or a feminine article; and epicœne, when it is always joined to some one of the two articles, and yet signifies both genders.

EPICOLIC REGION. (*regio epicolica*; from ἐπι, upon, and κωλον, the colon.) In anatomy, that part of the abdomen which lies over the head of the cœcum and sygmoid flexure of the colon.

EPICRANIUM. (*epicranium*, ἐπικρανιον; from ἐπι, and κρανιον, the cranium.) The common integuments, aponeurosis, and muscular expansion which lie upon the cranium.

EPICRANIUS. See OCCIPITO-FRONTALIS.

EPICTETUS, an ancient Stoic philosopher of Hierapolis, in Phrygia. He was the slave of Epaphroditus, the freedman of Nero; but when, or by what means, he obtained his liberty does not appear. When Domitian banished the philosophers from Rome, he went to Nicopolis, but returned on the death of that tyrant, and was in great esteem with Adrian and Marcus Aurelius. He preferred poverty to riches, and resided in a cottage which had no furniture but an earthen lamp, which sold after his death for 3000 drachmas, near 100*l* sterling. Here he wrote his Enchiridion, or Compendium of the Stoic Philosophy. It abounds in the purest maxims of morality, expressed with energy and plainness. The best edition of his works is that of Upton, in 2 vols. 4to. London, 1739. Mrs. Carter has given a good translation of Epictetus into English.

E'PICURE. *s.* (*epicureus*, Latin.) A man given wholly to luxury (*Locke*).

EPICURE'AN. *a.* Luxurious; contributing to luxury (*Shakspeare*).

EPICUREAN PHILOSOPHY, the doctrine or system of philosophy maintained by Epicurus and his followers. This consisted of three parts; canonical, physical, and ethical. The first respected the canons or rules of judging, in which soundness and simplicity of sense, assisted by some natural reflections, chiefly formed his art. His search after truth proceeded only by the senses; to the evidence of which he gave so great a certainty, that he considered them as an infallible rule of truth, and termed them the first natural light of mankind.

In the second part of his philosophy he laid down atoms, and space, as the first principles of all things. He asserted the existence of God, whom he accounted a blessed immortal, being, but who did not concern himself with human affairs.

"In its mere physical contemplation," says Mr. Good, "the theory of Epicurus allows of nothing but matter and space, which are equally infinite and unbounded, which have equally existed from all eternity, and from different combinations of which every individual being is created. These existences *have no property in common* with each other; for, whatever matter is, that space is the reverse of; and whatever space is, matter is the contrary to. The actually solid parts of all bodies, therefore, are matter; their actual pores, space, and the parts which are not altogether solid, but an intermixture of solidity and pore, are space and matter combined. Anterior to the formation of the universe, space and matter existed uncombined, or in their pure and elementary state. Space, in its elementary state, is positive and unsolid void: matter, in its elementary state, consists of inconceivably minute seeds or atoms; so small that the corpuscles of vapour, light, and heat, are compounds of them; and so solid that they cannot possibly be broken, or made smaller, by any concussion or violence whatever. The express figure of these primary atoms is various: there are round, square, pointed, jagged, as well as many other shapes. These shapes, however, are not diversified to infinity; but the atoms themselves, of each existent shape, are infinite or innumerable. Every atom is possessed of certain intrinsic powers of motion. Under the old school of Democritus, the perpetual motions exhibited were of two kinds: a descending motion, from its own gravity; and a rebounding motion, from mutual concussion. Besides these two motions, and to explain certain phænomena which the following poem developes, and which were not accounted for under the old system, Epicurus supposed that some atoms were occasionally possessed of a third, by which, in some very small degrees, they descended in an oblique or curvilinear direction, deviating from the common and right line anomalously; and hence, in this respect, resembling the oscillations of the magnetic needle.

"These infinitudes of atoms, flying immemorially in such different directions, through all the immensity of space, have interchangeably tried and exhibited every possible mode of action; sometimes repelled from each other by concussion, and sometimes adhering to each other from their own jagged or pointed construction, or from the casual interstices which two or more connected atoms must produce, and which may just be adapted to those of other configurations, as globular, oval, or square. Hence the origin of compound bodies; hence the origin of immense masses of matter; hence, eventually, the origin of the world itself. When these primary atoms are closely compacted together, and but little vacuity or space intervenes, they produce those kinds of substances which we denominate solid, as stones, and metals: when they are loose and disjoined, and a large quantity of space or vacuity occurs between them, they produce the phænomena of wool, water, vapour. In one mode of combination, they form earth; in another, air; and in another, fire. Arranged in one way, they produce vegetation and irritability; in another way, animal life and perception. Man hence arises; families are formed; society multiplies, and governments are *instituted.*

"The world, thus generated, is perpetually sustained by the application of fresh elementary atoms, flying with inconceivable rapidity through all the infinitude of space, invisible from their minuteness, and occupying the posts of all those that are as perpetually flying off. Yet, nothing is eternal and immutable but these elementary seeds or atoms themselves: the compound forms of matter are continually decompounding, and dissolving into their orginal corpuscles: to this there is no exception: minerals, vegetables, and animals, in this respect all alike, when they lose their present configuration, perishing from existence for ever, and new combinations proceeding from the matter into which they dissolve. But the world itself is a compound, though not an organized being; sustained and nourished like organized beings from the material pabulum that floats through the void of infinity. The world itself must therefore, in the same manner, perish: it had a beginning, and it will eventually have an end. Its present crisis will be decompounded; it will return to its original, its elementary atoms; and new worlds will arise from its destruction.

"Space is infinite, material atoms are infinite, but the world is not infinite. This, then, is not the only world, or the only material system that exists. The cause whence this visible system originated is competent to produce others; it has been acting perpetually from all eternity; and there are other worlds and other systems of worlds existing around us. In the vast immensity of space, there are also other beings than man, possessed of powers of intellect and enjoyment far superior to our own: beings who existed before the formation of the world, and will exist when the world shall perish for ever; whose happiness flows unlimited, and unallayed; and whom the tumults and passions of gross matter can never agitate. These the founder of the system denominated gods: not that they created the universe, or are possessed of a power of upholding it; for they are finite and created beings themselves, and endowed alone with finite capacities and powers; but from the uninterrupted beatitude and tranquillity they enjoy, their everlasting freedom from all anxiety and care." (*Good's Lucretius.* I. cviii—cxi.)

As to the ethics of Epicurus, he made the supreme good of man to consist in pleasure, and consequently supreme evil in pain. Nature itself, says he, teaches us this truth; and prompts us from our birth to procure whatever gives us pleasure, and avoid what gives us pain. To this end he proposes a remedy against the sharpness of pain, which was to divert the mind from it by turning our whole attention upon the pleasures we have formerly enjoyed. He held that the wise man must be happy, as long as he is wise: that pain, not depriving him of his wisdom, cannot deprive him of his happiness. It is an essential defect in his scheme of morals, that it had no regard to the Deity; or to a divine authority and law. His morality is also defective with regard to the duties we owe to mankind. He taught that business and cares do not consist with happiness; and that a wise man ought not to marry, or to concern himself with public affairs. He gives excellent precepts of moderation, temperance, and the government of the passions; represents the inconvenience of indulging venereal pleasures; and declares that the pleasures he recommends are not those of luxury and excess, but such as are under the conduct of prudence. The virtues he prescribed are resolved wholly into a man's private advantage, without regard to the excellence of virtue, or to a divine command: he forbids injustice and other crimes, not because of any evil there is in them considered in themselves, but for fear of human punishments. He taught that happiness consists in indolence of the body and tranquillity of mind. And what he chiefly insisted upon as necessary to make men happy, was the delivering them from the fear of the gods, and the fear of death. His remedy against the first was to deny a Providence that concerneth itself with human affairs; what was urged against the latter was very feeble. It was a fundamental article of this system that man is to worship the Deity, induced by no hope, by no reward, but on account of his excellent majesty and supreme nature alone.

EPICUREANS, the sect of philosophers holding or following the principles and doctrine of Epicurus.

EPICURISM. *s.* (from *epicure.*) Luxury; sensual enjoyment; gross pleasure (*Calamy*).

EPICURUS, a celebrated philosopher, born at Gargetium, in Attica. He gave an early proof of the brilliancy of his genius at the age of 12, when his preceptor repeated him this verse from Hesiod,

Ητοι μεν πρωτιστα χαος γενετ', &c.

"In the beginning of things the Chaos was created."

Epicurus earnestly asked him who created it? To this the teacher answered, that he knew not, but only philosophers. "Then," says the youth, "philosophers henceforth shall instruct me." After having improved himself, he visited Athens, which was then crowded by the followers of Plato, the Cynics, the Peripatetics, and the Stoics. Here he established himself, and soon attracted a number of followers by the sweetness and gravity of his manners, and by his social virtues. The Stoics particularly attacked his doctrine, but he refuted all the accusations of his adversaries by the purity of his morals. His health was at last impaired by continual labour, and he died of a retention of urine 270 years before Christ, in the 72d year of his age. The followers of Epicurus were numerous in every age and country, but they soon degenerated from the comparatively pure sentiments of their master, and placed their happiness in gross sensual pleasures.

EPICYCLE, in the ancient astronomy, a little circle whose centre is in the circumference of a greater circle: or it is a small orb or sphere, which being fixed in the deferent of a planet, is carried along with it; and yet, by its own peculiar motion, carries the planet, fastened to it, round its proper centre. It was by means of epicycles that Ptolemy and his followers solved the various phenomena of the planets, but more especially their stations and retrogradations.

EPICYCLOID, in geometry, a curve generated by the revolution of the periphery of a circle, along the convex or concave side of the periphery of another circle.

The length of any part of the curve, which any given point in the revolving circle has described, from the time it touched the circle whereon it revolved, is to double the versed sine of half the arch which during that time touched the quiescent circle, as the sum of the diameters of the circles to the semidiameter of the quiescent circle; provided the revolving circle moves upon the convex side of the quiescent circle; but if upon the concave side, as the difference of the diameters to the semidiameter.

Dr. Halley gives us a general proposition for the measuring of all cycloids and epicycloids: thus, the area of a cycloid, or epicycloid, either primary, or contracted, or prolate, is to the area of the generating circle; and also the areas of the parts, generated in those curves, to the areas of analogous segments of the circle; as the sum of double the velocity of the centre, and velocity of the circular motion, to the velocity of the circular motion. The demonstration hereof, see in Phil. Trans. N° 218. See, farther, our article CYCLOID.

EPICYCLOID (Spherical). Let there be a right cone the summit of which remains immoveable; if the base of that cone be made to revolve at pleasure with regard to its summit, and if we imagine a style or trace fixed in any point of the periphery of the cone's base, this style will describe during the motion of the cone a curve which is called a spherical epicycloid, being epicycloidal in its nature, yet always found in the surface of a given sphere.

This kind of curve is useful in forming the teeth of wheels. See Camus, Cours de Mathematique, part 3; or Gregory's Mechanics, vol. ii.

EPICYEMA, among physicians, a superfœtation.

EPIDAURIA, in antiquity, a festival at Athens in honour of Æsculapius.

EPIDEMIA, in antiquity, feasts of Apollo at Delphos and Miletus, and of Diana at Argos.

EPIDEMIC. (*epidemicus*, επιδημιος; from επι, and δημος, the people.) A contagious disease is so termed that attacks many people at the same season, and in the same place; [illegible] putrid fever, plague, dysentery, &c. are often *epidemic*.

EPIDENDRUM, in botany, a genus of the class gynandria, order dyandria. Nectary turbinate, oblique, reflected; corol spreading without spur. A hundred and twenty-two species; natives of the East and West Indies. Of these the following are the chief. See botany, Plate XCI.

1. E. vanillo. A West Indian plant, leaves ovate, oblong, nerved, sessile, cauline; tendrils spiral. The dried pods are sold under the name of vanilloes or vanelloes; and generally in the form of chocolate, of which they constitute the basis. It is a parasitic plant, and its leaves considerably resemble those of the vine; with flowers of a white ground, but intermixed with stripes of red and yellow. The pods are usually gathered between September and December; they are gradually dried in the shade, and in the process of dying occasionally rubbed over with a little oil of cocoa or calba to preserve them the better, and prevent them from becoming unnecessarily dry. It is from these pods that the chocolate derives its elegant perfume. To be propagated in our own country, this plant requires a stove, and in America must be reared in the immediate vicinity of some tree, that it may have an opportunity of shooting up its branches.

2. E. flos aëris: a native of Java and India; stem columnar, somewhat branched, climbing; leaves lanceolate; petals linear, obtuse. We have many instances among the parasitic plants that they do not require for their existence or growth that their roots or radical filaments should be in the earth: but the present species is able to support itself from the air alone, according to the account of Loureiro, who repeats the common assertion of its being suspended from the ceilings in the halls of large houses or palaces on the banks of the Ganges, and still continuing to blossom annually; and adds, that he himself was a witness to its vegetating in such situation for years, renewing its elegant corols in their season, and perfuming the circumambient atmosphere with its exquisite aroma.

3. E. sinense, Chinese epidendrum; with ensiform leaves; nervous striate radicles, nodding flowers; subequal petals; revolute, concave nectary, dotted within; bracte a little shorter than the germ. It has been hitherto treated as a stove-plant, but does not require so much heat as the West Indian species, thriving luxuriantly in the conservatory.

EPIDERMIS. (*epidermis*, επιδερμις; from επι, upon, and δερμα, the true skin.) In anatomy, the scarf skin. See CUTICLE.

EPIDERMIS, in botany, the outer, dry, and very thin coat or covering of a plant; corresponding with the scarf skin in animals. Tunica exterior plantæ sicca tenuissima.

EPIDIDYMIS. (*epididymis*, επιδιδυμος; from επι, upon, and διδυμος, a testicle.) A hard vascular oblong substance, that lies upon the testicle, formed of a convolution of the vas deferens. It has a thick end, which is convex, and situated posteriorly; and a thin end, which is rather flat, and situated inferiorly. The epididymis adheres to the testicle by its two extremities only, for its middle part is free, forming a bag, to which the tunica vaginalis of the testicle is attached.

EPIDROMUS. (of επι and δρομος, course.) In the ancient shipping, a sail near the stern, which was the largest but one in the ship.

EPIGÆA, in botany, a genus of the class decandria, order monogynia. Calyx double; the outer three-leaved, inner five-parted; corol salver-shaped; capsule five-celled. Two species; Virginia and Guadaloupe.

EPIGASTRIC REGION. (*epigastricus*, επιγαστρικος; from επι, upon or above, and γαστηρ, the stomach.) That part of the abdomen that lies over the stomach.

EPIGLOTTIS. (*epiglottis*, επιγλωττις; from επι, upon, and γλωττις, the tongue.) The cartilage at the root of the tongue that falls upon the glottis or superior opening of the larynx. Its figure is nearly oval; it is concave posteriorly, and convex anteriorly. Its apex or superior extremity is loose, and is always elevated upwards by its own elasticity. While the back of the tongue is drawn backwards in swallowing, the epiglottis is put over the aperture of the larynx, hence it shuts up the passage from the mouth into the larynx. The base of the epiglottis is fixed to the thyroid cartilage, the os hyoides, and the base of the tongue, by a strong ligament.

EPIGONI, the sons and descendants of the Grecian heroes who were killed in the first Theban war. The war of the Epigoni is famous in ancient history. They resolved to avenge the death of their fathers, and marched against Thebes, under the command of Thersander. The Argives were assisted by the Corinthians, the people of Messenia, Arcadia, and Megara. The Thebans had engaged all their neighbours in their quarrel, as in one common cause. The two armies met and engaged on the banks of the Glissas. The fight was obstinate and bloody, but victory declared for the Epigoni, and some of the Thebans fled to Illyricum with Leodamas their general, while others retired into Thebes, where they were soon besieged, and forced to surrender. (*Paus.* &c.)

EPIGONIUM, a musical instrument, so named from its inventor Epigonius. It had forty strings; but whether they formed a scale of forty different sounds or not, is uncertain.

EPIGRAM, in poetry, a short poem, or composition in verse, treating only of one thing, and ending with some point, or lively ingenious thought. The word is formed of επιγραμμα, inscription, of επιγραφειν, to inscribe, or write upon. Epigrams then, originally, signify inscriptions, and they derive their origin from those inscriptions placed by the ancients on their tombs, statues, temples, triumphal arches, &c. See INSCRIPTION.

M. le Brun, in the preface to his Epigrams, defines an epigram a little poem, susceptible of all kinds of subjects, and ending with a lively, just, and unexpected thought; which are three qualifications essential to the epigram; particularly the first and last of them, viz. brevity, and the point or close of the epigram.

The Greek epigrams have scarce any thing of the point, or briskness, of the Latin ones: those collected in the Anthology have most of them a remarkable air of ease and simplicity, attended with something just and witty; such as we find in a sensible peasant, or a child that has wit. They have nothing that bites, but something that tickles. Though they want the salt of Martial, yet to a good taste they are not insipid; except a few of them, which are quite flat and spiritless. However, the general faintness, and delicacy of the pleasantry in them, has given occasion for a Greek epigram, or epigram à la Greque, to denote, among the French, an epigram void of salt or sharpness.

We shall here put down a few epigrams, as they occur to our recollection.

1. By Dr. Young.

As in smooth oil the razor best is whet,
So wit is by politeness sharpest set;
Their want of edge from their offence is seen,
Both pain us least when exquisitely keen.

2. By Grierson.

Jack, eating rotten cheese, did say,
Like Samson, I my thousands slay:
I vow, quoth Roger, so you do,
And with the selfsame weapon too.

3. By Prior.

On his death-bed poor Simon lies,
His spouse is in despair:
With frequent sobs, and mutual cries,
They both express their care.
A different cause, says parson Sly,
The same effect may give;
Poor Simon fears that he shall die,
His wife—that he may live.

4. By Aaron Hill.

When Christ at Cana's feast, by pow'r divine,
Inspir'd cold water with the warmth of wine,
See! cried they, while in redd'ning tide it gush'd,
The bashful stream hath seen its God, and blush'd!

5. By Aaron Hill.

Tender-handed stroke a nettle,
And it stings you for your pains;
Grasp it like a man of mettle,
And it soft as silk remains.
'Tis the same with common natures:
Use 'em kindly, they rebel;
But, be rough as nutmeg-graters,
And the rogues obey you well.

6. From Martial.

Curmudgeon the rich widow courts,
Nor lovely she, nor made for sports;
'Tis to Curmudgeon charm enough,
That she has got a church-yard-cough.

7. From Martial.

When Arria from her wounded side
To Pætus gave the reeking steel,
I feel not what I've done—she cried;—
What Pætus is to do, I feel.

8. From Martial.

Her father dead—*alone* no grief she knows;
The obedient tear at every *visit* flows:
No mourner he, who must by praise be feed,
But he, who mourns in *secret*, mourns indeed!

9. From Anacreon.

To love is painful, it is true;
And not to love, is painful too:
But, ah! it gives the greatest pain,
To love and not be lov'd again!

10. By Dr. Doddridge, on the motto to his family arms "Dum vivimus vivamus."

"Live while you live," the epicure would say,
"And seize the pleasures of the present day."
"Live while you live," the sacred preacher cries,
"And give to God each moment as it flies."
Lord, in my views let both united be;
I live in pleasure when I live to Thee.

EPIGRAMMATICAL. Epigramma'tic. *a.* (*epigrammaticus*, Latin.) 1. Dealing in epigrams; writing epigrams (*Camden*). 2. Suitable or belonging to epigrams (*Addison*).

EPIGRA'MMATIST. *s.* (from *epigram*.) One who writes or deals in epigrams (*Pope*).

EPIGRAPHE, among antiquarians, denotes the inscription of a building, pointing out the time when, the persons by whom, and the uses for which it was erected.

EPILEPSY. (*epilepsia*, επιληψια; from επιλαμβανω, to seize upon: so called, from the suddenness of its attack.) Convulsions with sleep, and usually froth issuing from the mouth. It is a genus of disease in the class neuroses, and order spasmi of Cullen, and contains nine species: 1. Epilepsia traumatica, arising from an injury of the head: 2. Epilepsia a dolore, from pain: 3. Epilepsia verminosa, from the irritation of worms: 4. Epilepsia a veneno, from poisons: 5. Epilepsia exanthematica, from the repulsion of cutaneous eruptions: 6. Epilepsia à cruditate ventriculi, from crudities of the stomach: 7. Epilepsia ab inanitione, from debility: 8. Epilepsia uterina, from hysterical affections: 9. Epilepsia ex onanismo, from onanism.

EPILE'PTIC. *a.* (from *epilepsy*.) Convulsed; diseased with an epilepsy (*Arbuthnot*).

EPILOBIUM. Willow-herb. In botany, a genus of the class octandria, order monogynia. Calyx four-cleft, tubular; petals four; capsule oblong, inferior; seeds feathered. Thirteen species; some with declined stamens, others with stamens erect, and regular, and cloven petals. Not less than eight species are common to the meadows, woods, or ditches of our own country; the blossom is usually red, and often beautiful. Some of the species have an intoxicating quality, especially e. angustifolium, which is used by the Kamscadales for this purpose. The down of the seed has lately been introduced into our hat and cotton manufactories.

EPILOGUE, in oratory, the conclusion of a discourse, ordinarily containing a recapitulation of the principal matters delivered.

Epilogue, in dramatic poetry, a speech addressed to the audience after the conclusion of the play, by one of the principal actors therein, usually containing some reflections on certain incidents in the play, especially those in the part of the person that speaks it.

In the modern tragedy the epilogue has usually somewhat of pleasantry, intended, in all probability, to compose the passions raised in the course of the representation. This is ridiculed by the Spectator, and compared to a merry jig upon the organ, after a good sermon, to wipe away any impressions that might have been made thereby, and send the people away just as they came.

EPIMEDIUM. Barren-wort. In botany, a genus of the class tetrandria, order monogynia. Corol four-petalled; nectaries four pouches lying on the petals; calyx caducous; silique? One species only; a low herbaceous plant, found in the woods of our own country.

EPIMENIDES, a Cretan poet and philosopher, who is said to have lived 289 years, and by others 157. He wrote a poem, from which St. Paul quotes this remarkable passage: "The Cretans are always liars, evil beasts, slow bellies."

EPIMETHEUS, in fabulous history, son of Japetus, and brother to Prometheus, married Pandora, and though warned of the danger, opened the fatal box presented her by Jupiter, by which means vice, folly, and diseases, overspread the earth. He had by Pandora a daughter, named Pyrrha, who married Deucalion; but Jupiter metamorphosed him into an ape, and banished him.

EPIMETRON, an allowance given the tax-gatherers in the Roman provinces, over and above their lawful demand of wine, grain, &c

EPINAL, a town of France, in the department of the Vosges, famous for its paper-mills. Lat. 48. 4. N. Lon. 6. 0 E.

EPINICION. (Επινικιον, from επι, on, and νικη, victory.) In the Greek and Latin poetry, denotes, both, a feast on occasion of a victory, and the poem which celebrates it.

EPINYCTIS. (Επινυκτις; from επι, on, and νυξ, night.) A pustule, which rises in the night, forming an angry tumor on the skin of the arms, hands, and thighs, of the size of a lupine, of a dusky red, and sometimes of a livid and pale colour, with great inflammation and pain. In a few days it breaks and sloughs away

EPIPHANIUS (St.) an ancient father of the church, born at Besanducan, a village in Palestine, about the year 332. He founded a monastery near the place of his birth, and presided over it. He was afterwards elected bishop of Salamis; when he sided with Paulinus against Meletius, and ordained in Palestine, Paulinian, the brother of St. Jerom; on which a contest arose between him and John bishop of Jerusalem. He afterwards called a council in the island of Cyprus, in which he procured a prohibition of the reading of Origen's writings; and made use of all his endeavours to prevail on Theophilus bishop of Alexandria to engage St. Chrysostom to declare in favour of that decree: but not meeting with success, he went himself to Constantinople, where he would not have any conversation with St. Chrysostom; and formed the design of entering the church of the apostles, to publish his condemnation of Origen: but being informed of the danger to which he would be exposed, he resolved to return to Cyprus; but died at sea, in the year 403. His works were printed in Greek, at Basil, 1544, in folio; and were afterwards translated into Latin, in which language they have been often reprinted. Petavius revised and corrected the Greek text by two manuscripts, and published it together with a new translation at Paris in 1622. This edition was reprinted at Cologne in 1682.

Epiphanius, an heresiarch, and the son of Carpocrates. He maintained that a community of women was the re-establishment of primitive order, and that our natural desires are natural rights, which cannot be restrained without injustice. He opposed his system to that of the gospel, and after his death he was worshipped by his followers as a deity.

EPIPHANY, a Christian festival, otherwise called the Manifestation of Christ to the Gentiles, observed on the sixth of January, in honour of the appearance of our Saviour to the three magi or wise men, who came to adore him and bring him presents.

EPIPHONEMA. *s.* (επιφωνημα.) An exclamation; a conclusive sentence not closely connected with the words foregoing (*Swift*).

EPIPHORA. (επιφορα; from επιφερω, to carry forcibly.) The watery eye. An involuntary flow of tears. A superabundant flowing of a serous or aqueous humour from the eyes. A genus of disease in the class locales, and order apocenoses, of Cullen. The humour which flows very copiously from the eye in epiphora, appears to be furnished not only by the lachrymal gland, but from the whole surface of the conjunctive membrane, Meibomius's glands, and the caruncula lachrymalis; which increased and morbid secretion may be induced from any stimulus seated between the globe of the eye and lid, as sand, acrid fumes, and the like; or it may arise from the stimulus of active inflammation; or from the acrimony of scrophula, measles, small-pox; or from general relaxation. The disease may also be brought on by causes obstructing the absorption of the tears.

EPIPHYLLOSPERMOUS PLANTS. (of επι, φυλλον, leaf, and σπερμα, seed.) The same as the capillaries, herbs which bear their seed on the back part of their leaves.

EPIPHYSIS. (*epiphysis*, επιφυσις; from επι, upon, and φυω, to grow.) Any portion of bone growing upon another, but separated from it by a cartilage.

EPIPLOCE. *s.* (επιπλοκη.) A figure of rhetoric, by which one aggravation, or striking circumstance, is added in the due gradation to another.

EPIPLOCELE. (*epiplocele*, επιπλοκηλη; from επιπλοον, the omentum, and κηλη, a tumour.) An omental hernia. A rupture produced by the protrusion of a portion of the omentum. See Hernia.

EPIPLOIC APPENDAGES. See Appendiculæ epiploicæ.

EPIPLOITIS. (*epiploitis*, επιπλοιτις; from επιπλοον, the omentum.) An inflammation of the process of the peritoneum, that forms the epiploon or omentum. See Peritonitis.

EPIPLOOMPHALON, in medicine, an hernia umbilicalis, proceeding from the omentum falling into the region of the umbilicus or navel.

EPIPLOON. (*epiploon*, επιπλοον; from επιπλοω, to sail over, because it is mostly found floating, as it were, upon the intestines.) See Omentum.

EPIRUS, a country situate between Macedonia, Achaia, and the Ionian sea. It was formerly governed by kings, of whom Neoptolemus, son of Achilles, was one of the first. It was afterwards joined to the empire of Macedonia, and at last became a part of the Roman dominions. It is now called Larta.

This country, according to Josephus, was first peopled by Donanim, the son of Javan and grandson of Japhet. The people were very warlike: but they continued in their savage state long after their neighbours were civilized; whence the islanders used to threaten their offenders with transportation to Epirus. Their horses were in great request among the ancients, as well as the dogs produced in one of the divisions called Molossus; and hence these dogs were called by the Romans Molossi.

EPISCHESIS. (*epischesis*, επισχεσις; from επισχεω, to restrain.) A suppression of excretions. It is an order in the class locales of Cullen's nosology.

EPISCIRA. (Επισκιρα.) In antiquity, a festival celebrated at Scira in Attica, in honour of Ceres and Proserpine.

EPISCOPACY, that form of church-government, in which diocesan bishops are established as distinct from and superior to priests or presbyters. It has been much controverted whether the distinction be of divine or human right; whether it was settled in the apostolic age or afterwards. (See Bishop.) This controversy commenced soon after the reformation; and has been agitated with great warmth between the Episcopalians on the one side, and the Presbyterians, Baptists, and Independents on the other. Among the Protestant churches abroad, those which were reformed by Luther and his associates are in general episcopal; whilst such as follow the doctrines of Calvin have for the most part thrown off the order of bishops as one of the corruptions of popery. In England, however, the controversy has been considered as of greater importance than on the continent: for it has been strenuously maintained by one party, that the episcopal order is essential to the constitution of the church; and by others, that it is a pernicious encroachment on the rights of men, for which there is no authority in scripture.

EPISCOPAL, something that belongs to a bishop. The word is formed of the Greek επισκοπος, overseer, derived from επισκοπεω, *inspicio*, I inspect, or overlook. Episcopal government is the government of a diocese, wherein one single person, legally consecrated, presides over the clergy of a whole district, in quality of head, or superintendent thereof; conferring orders, and exercising a sort of jurisdiction.

EPISCOPALIANS, in church history, an appellation given to those who prefer the episcopal government and discipline to all others.

The episcopalians, in the modern acceptation of the term, belong more especially to the church of England, and derive this title from *episcopus*, the Latin word for bishop; or if it be referred to its Greek origin from Σκοπεω, to look, επι, over, implying the care and diligence with which bishops are expected to preside over those committed to their guidance and direction. They insist on the divine origin of their bishops, and other church officers, and on the alliance between church and state. Respecting these subjects, however, Warburton and Hoadley, together with others of the learned amongst them, have different opinions, as they also have on their thirty-nine articles; which were established in the reign of queen Elizabeth. These are to be found in most Common Prayer-Books; and the episcopal church in America has reduced their number to twenty. By some the articles are made to speak the language of Calvinism, and by others they have been interpreted in favour of Arminianism.

The church of England is governed by the king, who is the supreme head; by two archbishops, and by twenty-four bishops. The benefices of the bishops were converted by William the Conqueror into temporal baronies; so that every prelate has a seat and vote in the house of peers. Dr. Benjamin Hoadley, however, in a sermon preached from this text, "My kingdom is not of this world," insisted that the clergy had no pretensions to temporal jurisdiction, which gave rise to various publications, termed by way of eminence the Bangorian controversy, Hoadley being the bishop of Bangor.

Since the death of the intolerant archbishop Laud, men of moderate principles have been raised to the see of Canterbury, and this hath tended not a little to the tranquillity of church and state. The established church of Ireland is the same as the church of England, and is governed by four archbishops, and eighteen bishops.

The episcopalians of the English established church have had and still have amongst their clergy a great number of very learned and eminent men; to speak of whom in terms consistent with their appropriate merits would fill a volume. It must suffice if we barely mention the names of a few of the most distinguished, such as, Atterbury, Barrow, Bentley, Blackwall, Buchanan, Bull, Burnet, Butler, Chillingworth, Clarke, Cunningham, Daubeny, Delany, Fry, Gastrel, Gilpin, Hall, Hammond, Hervey, Hoadley, Hooker, Horsley, Hurd, Law, Lowth, Marsh, Milner, Middleton, Newton, Overton, Owen of Fulham, Paley, Parr, Patrick, Pearson, Porteus, Prideaux, Raine, Rennell, J. Robinson, Secker, Stillingfleet, Stock, South, Jer. Taylor, Tillotson, Tomlins, Toplady, Vincent, Wallis, Waterland, Warburton, Watson, Wells, Whitby, Wilkins, Wrangham, and Young.

EPI'SCOPATE. *s.* (*episcopatus*, Lat.) A bishoprick; the office and dignity of a bishop.

EPISCOPIUS (Simon), a learned divine, born at Amsterdam in 1583. When the disputes broke out between the Calvinists and Arminians, he joined the latter, and on the death of Arminius became their leader. In 1612 he was chosen divinity professor at Leyden, but he met with considerable trouble on account of his opinions. In 1615 he was at Paris, which gave his enemies an opportunity of reporting that he had been concerting there the ruin of the protestant church and the United Provinces. He was at the synod of Dort as the principal of the remonstrant party, where he behaved with great spirit. This arbitrary assembly deposed Episcopius and the other deputies from their ministerial functions, and banished them from the republic. He then went to Antwerp with several others of his party, and employed himself there in writing against popery. In 1626 he returned to Holland, and was made minister of the church of the remonstrants at Rotterdam. In 1634 he removed to Amsterdam, where he was chosen rector of the Remonstrant's college. He died in 1643. His works were printed in 2 vols. folio; the first in his life-time, and the second posthumous (*Watkins*).

EPISODE. (Επεισοδιον; from επι, upon, and εισοδος, entry.) Is commonly conceived to be a separate incident, story, or action, which an historian, or poet, inserts, and connects with his principal action; to furnish out the work with a greater diversity of events; though, in strictness, all the particular incidents, whereof the action or narration is composed, are called episodes.

The episode, in its original, was only something rehearsed between the parts of the chorus, or ancient tragedy, for the diversion of the audience. Episodes serve to promote the action, to illustrate, embellish, and adorn it, and carry it to its proper period. Episodes are either absolutely necessary, or very requisite. All episodes are incidents, though all incidents are not episodes; because some incidents are not adventitious to the action, but make up the very form and series of it. Examples will clear up this distinction: the storm in the first Æneid of Virgil, driving the fleet on the coast of Carthage, is an incident, not an episode, because the hero himself, and the whole body of his forces, are concerned in it; and so it is a direct and not a collateral part of the main action. The adventures of Nisus and Euryalus, in the ninth Æneid, are episodes, not incidents, i. e. not direct parts of the main action. See POETRY.

EPISO'DICAL. EPISO'DIC. *a.* (from *episode.*) Contained in an episode (*Dryden*).

EPISPA'STIC. *a.* (επι and σπαω,) 1. Drawing. 2. Blistering (*Arbuthnot*).

EPISPASTICS. (*epispastica medicamenta*, επιϛπαϛικα; from επισπαω, to draw together.) Substances which increase the action of the vessels in those parts of the surface of the body to which they are applied, in such a manner as to produce an efflux of fluids there; as cantharides, squills, boiling water, &c. They are mostly employed, 1. To diminish violent pain. 2. To take off the effects of uncommon sensibility. 3. To remove torpor. 4. To diminish the impetus of the blood against any part morbidly affected. 5. To diminish the morbid increase of action in vessels in the neighbourhood of those to which they are applied. 6. To diminish the quantity of circulating fluids. 7. To evacuate morbid accumulations of serum.

EPISTAPHILI'NUS. (from επι and σταφυλινος, a parsnip.) The uvula, from its resemblance to this root. See UVULA.

EPISTA'XIS. (*epistaxis*, επιϛαξις; from επιϛαζω, to distil from.) Bleeding at the nose, with pain, or fulness of the head. A genus of disease arranged by Cullen in the class pyrexiæ and order hæmorrhagiæ.

EPISTHO'TONOS. (*episthotonos*, επιϛθοτονος; from επιϛθω, forwards, and τεινω, to extend.) A spasmodic affection of muscles drawing the body forwards. See TETANUS.

EPISTLE, a letter missive. The word is formed of επιϛελλω, I send. The term epistle is now scarce used, but for letters written in verse, and letters dedicatory.

In speaking of letters written by moderns, or rather in the modern languages, we never use the word epistle. Thus we say the letters, not epistles, of the cardinal D'Ossat, of Voiture, of Balzac, of Howel, of Pope, &c. but those wrote by the ancients, or rather in the ancient languages, we call epistles: as the epistles, not letters, of Cicero, Pliny, Seneca. The epistles of St. Paul, St. Peter, St. John, &c. to the Romans, Corinthians, &c.

A Table of St. Paul's Epistles in the order of time, with the places where, and the times when they were written.

Epistles.	*Places.*		*A.D*
1 Thessalonians 2 Thessalonians	Corinth		52
Galatians	Corinth, or Ephesus	Near the end of or the beginning of	52 53
1 Corinthians	Ephesus	The beginning of	56
1 Timothy	Macedonia		56
Titus	Macedonia, or near it	Before the end of	56
2 Corinthians	Macedonia	About October	57
Romans	Corinth	About February	58
Ephesians	Rome	About April	61
2 Timothy	Rome	About May	61
Philippians	Rome	Before the end of	62
Colossians	Rome	Before the end of	62
Philemon	Rome	Before the end of	62
Hebrews	Rome, or Italy	In the spring of	63

A Table of the Seven Catholic Epistles, so called, because they were written to Christians in general, and the Revelation, with the places where, and the times when they were writ.

Epistles.	*Places.*		*A.D.*
The Epistle of St. James	Judæa	61 or beginning of	62
The 2 Epistles of St. Peter	Rome		64
S . John's 1st Epistle	Ephesus	About	80
His 2d and 3d Epistles	Ephesus	Between 80 and	90
The Epistle of St. Jude	Unknown		64 or 65
The Revelation of St. John	Patmos, or Ephesus		95 or 96

See Lardner's Credibility of the Gospel History, vol. xvi. and vol. xvii

Learned writers are not absolutely agreed as to the dates of these several epistles, nor the places whence they were written. It would lead us too far to examine and produce the various authorities and arguments that have been used for settling these particulars: we shall only mention that Dr. Doddridge dates the 1st Epistle to the Corinthians about the year 57; and the 2d Epistle in 58; those to the Ephesians, Philippians, Colossians, and Philemon, in 63; the 1st to Timothy, in 58 or 65; the 2d to Timothy in 66 or 67; the Epistle to Titus, between St. Paul's first and second imprisonment at Rome; the Epistle of St. James, in 60 or 61; the 1st of Peter in 61; the 2d, in 67; that of St. Jude, sometime after the 2d of Peter, according to Dr. Mills, in the year 90.

EPISTLES AND GOSPELS, in the liturgy of the church of England, are select portions of scripture, taken out of the writings of the evangelists and apostles, and appointed to be read, in the communion-service, on Sundays and holidays. They are thought to have been selected by St. Jerom, and by him put into the lectionary.

EPI'STOLARY. *a.* (from *epistle.*) 1. Relating to letters; suitable to letters. 2. Transacted by letters (*Addison*).

EPI'STLER. *s.* (from *epistle.*) A scribbler of letters.

EPISTROPHE. (Επιστροφη.) In rhetoric, a figure wherein that which is supposed of one thing is strongly affirmed of another, and the repetition of the same word occurs at the end of each member or sentence.

"Since concord was lost, friendship was lost, fidelity was lost, liberty was lost, all was lost." Auct. ad Herenn. lib. iv. cap. 13. See also 2 Cor. xi. 22.

EPISTROPHÆUS. (επιστροφαιος; from επιστρεφω, to turn round, because the head is turned upon it.) Epistrophæus. The second cervical vertebra. See Dentatus.

EPISTYLE, the Greek term for architrave.

EPITAPH. (Επιταφιον; from επι, upon, and ταφος, sepulchre.) A monumental inscription, in honour or memory of a person defunct; or an inscription engraven or cut on a tomb, to mark the time of a person's decease, his name, family, and usually some eloge of his virtues or good qualities.

At Sparta, epitaphs were only allowed to people who died in battle. Boxhornius has made a collection of epitaphs not very ample, but exceedingly well chosen. Fa. Labbe has likewise given a collection of the like kind in French, intitled, Tresor des Epitaphes. Camden, Weaver, and Tolderry, have done something in the same way with our English epitaphs.

In epitaphs, the dead person is sometimes introduced by way of prosopopœia, speaking to the living; of which we have a fine instance, worthy the Augustan age, the dead wife thus bespeaking her surviving husband.

Immatura peri: sed tu, felicior, annos
Vive tuos, conjux optimo, vive meos.

The French have a proverb, "Menteur comme une epitaphe;" He lies like an epitaph;

in allusion to the elogies ordinarily contained therein, which are not always rigidly just.

Dr. Johnson and others have criticised some of our finest epitaphs: but we have no room for their remarks. Our readers will find a beautiful specimen by Thomson under the word AIKMAN: we here add one by Cowley.

Here lies the great:—False marble, tell me where:
Nothing but poor and sordid dust lies here.

That of Alexander:

Sufficit huic tumulus, cui non sufficeret orbis.

That of Newton:

Isaacum Newton
Quem immortalem
Testantur Tempus, Natura, Cœlum,
Mortalem hoc marmor
Fatetur.

EPITASIS, in ancient poetry, the second part or division of a dramatic poem, in which the plot entered upon in the first part, or protasis, was carried on.

EPITHALAMIUM. (Εσιθαλαμιον; formed of επι and ϑαλαμος, bride-chamber.) In poetry, a nuptial song, or a composition, usually in verse, on occasion of a marriage between two persons of eminence.

The topics it chiefly insists on are the praises of matrimony, and of the married couple, with pomp and order of the marriage solemnity: it concludes with prayers to the gods for their prosperity, their happy offspring, &c.

EPITHELIUM. (*epithelium.*) The cuticle on the red part of the lips; the cuticle reflected upon the internal parts, as the mouth, rectum, &c.

EPITHEMA. (*epithema*, επιθημα; from επι, upon, and τιθημι, to apply.) A lotion, fomentation, or other external application of the same kind.

E'PITHET. *s.* (επιϑητον.) An adjective denoting any quality good or bad (*Swift*).

EPITHYMUM. (*epithymum*, επιθυμον; from επι, upon, and θυμος, the herb thyme.) Cuscuta. Dodder of thyme. A parasitic plant, possessing a strong disagreeable smell, and a pungent taste very durable in the mouth. Two kinds are recommended in melancholia, as cathartics, &c. Cuscuta epithymum; foliis sessilibus, quinquifidis, bracteis obvallatis, and cuscuta europæa; floribus sessilibus of Linnéus. See CUSCUTA.

EPI'TOME. *s.* (ἐπιτομη.) Abridgment; abbreviature; compendious abstract (*Wotton*).

To **EPI'TOMISE.** *v. a.* (from *epitome.*) 1. To abstract; to contract into a narrow space (*Donne*). 2. To diminish; to curtail (*Addison*).

EPI'TOMISER. EPI'TOMIST. *s.* (from *epitomise.*) An abridger; an abstracter.

EPITRITES, the musical ratio of 3 to 4.

EPITROPUS, a kind of judge or arbitrator, among the Greek Christians under the dominion of the Turks.

EPOBOLIA, in antiquity, a fine laid upon those that could not prove the indictment they had brought against their adversaries.

EPOCH, or EPOCHA, in chronology, a term or fixed point of time, from whence the succeeding years are numbered or reckoned. Different nations make use of different epochs. The Christians chiefly use the epoch of the nativity or incarnation of Jesus Christ; the Mahometans, that of the Hegira; the Jews that of the creation of the world, or that of the deluge; the ancient Greeks, that of the Olympiads; the Romans that of the building of their city; the ancient Persians and Assyrians, that of Nabonassar, &c. The doctrine and use of epochs is of very great extent in chronology. To reduce the years of one epoch to those of another, i. e. to find what year of one corresponds to a given year of another, a period of years has been invented, which, commencing before all the known epochs, is, as it were, a common receptacle of them all, called the Julian period. To this period all the epochs are reduced; i. e. the year of this period when each epoch commences is determined. So that, adding the given year of one epoch to the year of the period corresponding with its rise, and from the sum subtracting the year of the same period corresponding to the other epoch, the remainder is the year of that other epoch.

EPOCH OF CHRIST, is the common epoch throughout Europe, commencing at the supposed time of our Saviour's nativity, December 25; or rather, according to the usual account, from his circumcision, or the 1st of January. The author of this epoch was an abbot of Rome, one Dionysius Exiguus, a Scythian, about the year 507 or 527. Dionysius began his account from the conception or incarnation, usually called the Annunciation, or Lady Day; which method obtained in the dominions of Great Britain till the year 1752, before which time the Dionysian was the same as the English epoch: but in that year the Gregorian calendar having been admitted by act of parliament, they now reckon from the first of January, as in the other parts of Europe, except in the court of Rome, where the epoch of the incarnation still obtains for the date of their bulls.

A Table of the Years of the most remarkable Epochs or Eras and Events.

N. B. The years before Christ are those before the reputed year of his birth, and not reckoned back from the first year of his age, as is generally done in such tables.	Julian Period	Year of the World.	Years before Christ.
The Creation of the World	706	0	4007
The Deluge, or Noah's flood	2362	1656	2351
Assyrian monarchy founded by Nimrod	2557	1881	2176
The birth of Abraham	2714	2008	1999
Kingdom of Athens founded by Cecrops	3157	2451	1556
Entrance of the Israelites into Canaan	3262	2556	1451
The destruction of Troy	3529	2823	1184
Solomon's temple founded	3701	2995	1012
The Argonautic expedition	3776	3070	937
Lycurgus formed his laws	3829	3103	884
Arbaces, first king of the Medes	3838	3132	875
Olympiads of the Greeks began	3938	3232	775
Rome built, or Roman Era	3961	3255	752
Era of Nobonassar	5967	3261	746
First Babylonish captivity, by Nebuchadnezzar	4107	3401	606
The 2d ditto, and birth of Cyrus	4114	3408	599
Solomon's temple destroyed	4125	3419	588
Cyrus began to reign in Babylon	4177	3471	536
Peloponnesian war began	4282	3576	431
Alexander the Great died	4390	3684	323
Captivity of 100,000 Jews by Ptolomy	4593	3687	320
Archimedes killed at Syracuse	4506	3800	207
Julius Cæsar invaded Britain	4659	3953	54
He corrected the calendar	4667	3961	46
The true year of Christ's birth	4709	4003	4
The Christian Era begins here.			Years since Christ.
Dionysian or vulgar era of Christ's birth	4713	4007	0
Christ crucified, Friday April 3d	4746	4040	33
Jerusalem destroyed	4783	4077	70
Adrian's wall built in Britain	4833	4127	120
Dioclesian Epoch, or that of Martyrs	4997	4291	384
The council of Nice	5038	4332	325
Constantine the Great died	5050	4344	337
The Saxons invited into Britain	5158	4452	445
Hegira, or flight of Mohammed	5335	4629	622
Death of Mohammed	5343	4637	630
The Persian Yesdegird	5344	4638	631
Sun, Moon, and Planets, ♄, ♃, ♂, ♀, ☿, in ♎, seen from the earth	5899	5193	1186
Art of printing discovered	6153	5447	1440
The reformation begun by Martin Luther	6230	5524	1517
The Calendar corrected by pope Gregory	6295	5589	1582
Oliver Cromwell died	6371	5665	1658
Sir Isaac Newton born, Dec. 25	6355	5649	1642
Made president of the Royal Society	6416	5710	1703
Died, March 20th	6440	5734	1727
New Planet discovered by Herschel	6494	5788	1781

EPO'DE. *s.* (ἐπωδὸς.) The stanza following he strophe and antistrophe.

EPODYNE. (from ἐπι, and ὀδύνη, pain.) Producing or suffering much pain. The opposite to anodyne.

EPOPOEIA, in poetry, the history, action, or fable, which makes the subject of an epic poem. The word is derived from the Greek ἔπος, *carmen*, verse; and ποιεω, *facio*, I make. In the common use of the word, however, *popœia* is the same with *epos*, or epic poem tself. See the article EPIC POEM.

EPPING, a town in Essex, with a market n Fridays. The butter made in this neighourhood, and called Epping butter, is highly eemed in London. Epping is seated at the N. end of a forest of the same name. Lat. 51. 46 N. Lon. 0. 9 E.

EPROUVETTE. See POWDER-PROVER.

EPSOM, a town in Surrey, with a daily market. It is celebrated for its mineral waters and salts. Lat. 51. 25 N. Lon. 0. 15 W.

EPSOM SALTS. See MURIA, and MURABILE, for its mineral arrangement, and MAGNESIA VITRIOLATA for its medical properties.

EPSOM WATER. *Aqua Epsomensis.* This water evaporated to dryness leaves a residuum, the quantity of which has been estimated from an ounce and a half in the gallon to five drachms and one scruple. Of the total residuum, by far the greater part, about four or five sixths, is sulphat of magnesia mixed with a very few muriats, such as that of lime, and probably of magnesia, which render it very deliquescent, and increase the bitterness of taste, till purified by repeated crystallizations. There is nothing sulphureous or metallic ever found in this spring. The diseases in which it is employed are similar to those referred to Sedlitz water. There are many other simple saline springs which agree with that of Epsom, in containing a notable portion of some purging salt. This for the most part is either Epsom or Glauber's salt, or often a mixture of both, as at Acton, Kilburne, Bagnigge wells, Dog and Duck, St. George's Fields, &c.

EPULARES, in antiquity, an epithet given to those who were admitted to the sacred epulæ or entertainments, it being unlawful for any to be present at them who were not pure and chaste.

EPULA'TION. *s.* (*epulatio*, Latin.) Banquet; feast (*Brown*).

EPU'LIS. (*epulis*, επȣλις, from επι and ȣλα, the gums.) An excrescence growing from the gums.

EPULO, in antiquity, the name of a minister of sacrifice among the Romans.

EPULOTICS. (*epulotica, medicamenta*, επȣλοτικα; from επȣλοω, to cicatrize.) A term given by surgeons to those applications which promote the formation of skin.

EPULUM, in antiquity, a holy banquet prepared for the gods, in times of public danger. The word is also used to denote any solemn feast, as *epulum ferale*, a funeral entertainment.

EQUABI'LITY. *s.* (from *equable*.) Equality to itself; evenness; uniformity (*Ray*).

E'QUABLE. *a.* (*æqualilis*, Latin.) Equal to itself; even; uniform (*Bentley*).

E'QUABLY. *ad.* (from *equable*.) Uniformly; evenly; equally to itself (*Cheyne*).

E'QUAL. *a.* (*æqualis*, Latin.) 1. Like another in bulk, or any quality that admits comparison (*Hale*). 2. Adequate to any purpose (*Clarendon*). 3. Even; uniform (*Smith*). 4. In just proportion (*Dryden*). 5. Impartial; neutral (*Dryden*). 6. Indifferent (*Cheyne*). 7. Equitable; advantageous alike to both parties (*Maccabees*). 8. Being upon the same terms (*Maccabees*).

E'QUAL. *s.* (from the adjective.) 1. One not inferior or superior to another. 2. One of the same age (*Galatians*).

To E'QUAL. *v. a.* (from the noun.) 1 To make one thing or person equal to another. 2. To rise to the same state with another person. 3. To be equal to (*Shakspeare*). 4. To recompense fully (*Dryden*).

To E'QUALISE. *v.a.* (from *equal*.) 1. To make even (*Brown*). 2. To be equal to: not used (*Digby*).

EQUA'LITY. *s.* (from *equal*.) 1. Likeness with regard to any quantities compared (*Shakspeare*). 2. The same degree of dignity (*Milton*). 3. Evenness; uniformity; equability (*Brown*).

EQUALITY, in a political sense, is a term much used, though not generally understood. All men are upon an equality with regard to their rights. Their right to have their persons and their property (whether it be less or more) protected by the government under which they live, cannot be disputed. Neither can the right to do any thing that is not injurious to another, which is the only true definition of liberty, be called in question, let the party exercising it be ever so poor. But it is a dangerous error to suppose, that an equality of property is meant by the term; for that is to suppose, what is not the fact, that all men are equal in merit and in talents.

EQUALITY, in algebra, the relation or comparison between two quantities, that are really or effectually equal. This equality is generally denoted by the sign =, which was introduced by Robert Recorde, who assigns this reason: "And to avoide the tediouse repetition of these woordes: is equalle to: I will sette, as I doe often in woorke use, a paire of paralleles, or gemowe lines of one lengthe, thus: =, bicause noe 2 thynges can be moare equalle."

E'QUALLY. *ad.* (from *equal*.) 1. In the same degree with another (*Rogers*). 2. Evenly; equably; uniformly (*Locke*). 3. Impartially (*Shakspeare*).

E'QUALNESS. *s.* Equality (*Shakspeare*).

EQUA'NGULAR. *a.* (from *æquus* and *angulus*, Latin.) Consisting of right angles.

EQUANIMITY, in ethics, denotes an even, uniform temper of mind, amidst all the varieties and revolutions of time and chance. This virtue, together with prudence, forms the character which Horace gives of Aristippus:

> Omnis Aristippum decuit color et status et res.
>
> All parts and fortunes he alike became.

Equanimity is the immediate result of magnanimity, and no other than a proof and evidence of it. "The truly great man (says Andronicus Rhodius) in the change of his circumstances, will always act worthy of himself, not rejoicing over much in prosperity, nor dejected in adversity. His opinion of honour is not extravagant, in which he knows how to behave himself with moderation; and much more in riches and power, to both which honour is preferable." It is truly excellent to maintain an equal temper in every part of life: Philip of Macedon, with regard to the greatness of his victories and renown, was exceeded by his son Alexander, but superior to him in the mild evenness and humanity of his temper: he, therefore, was always great, whereas Alexander often acted very basely.

EQUA'NIMOUS. *a.* (*æquanimis*, Latin.) Even; not dejected; not elated.

EQUANT, in astronomy, a circle formerly imagined by astronomers, in the plane of the deferent; for regulating and adjusting certain motions of the planets.

EQUATION, in algebra, a proposition asserting the equality of two quantities, whether simple or compound; it is expressed by placing the sign = between them: thus $2+5=7$, x^2+ [illegible] $=c$. When the quantities compared are simple and similar, the equation is identical; as $4=4$, and $a=a$. Sometimes the quantities are brought all on one side, (by transposition), and made equal to 0, or nothing, on the other, as $4+3-7=0$, $x^3+2ax^2-7x=0$. &c.

Terms of an equation, are the several parts or quantities of which it is composed.

Equations are either simple or affected. A simple equation is that which has only one power of the unknown quantity, whether high or low, as $a+x=3b$, $4x^3=16c$. &c. An affected or adfected equation contains two or more different powers of the unknown quantity: as $x^2+2ax=b^2$, $x^3-4x^2+61x=12$. &c.

Equations, containing only one unknown quantity and its powers, are divided into orders, according to the highest power of the unknown quantity to be found in any of its terms.

If the highest power of the unknown quantity in any term be the

1st,	The Equation is called	*Simple,*
2d,		*Quadratic,*
3d,		*Cubic,*
4th, &c.		*Biquadratic, &c.*

The Root of an Equation, is the value of the unknown letter or quantity contained in it. And this value being substituted in the terms of the equation instead of that letter or quantity, will cause both sides to vanish, or will make the one side exactly equal to the other. According to the principles adopted by nearly all algebraists since the time of Harriot, every equation is said to have as many roots as it has dimensions, or as it contains units in the index of the highest power, when the powers are all reduced to integral exponents. So the simple equation of the 1st power, has only one root; but the quadratic has 2, the cubic 3, the biquadratic 4, &c.

The Relation between the Roots of Equations, and the Coefficients of their Terms. Every equation, when the terms are ranged in order according to the order of the powers, the greater before the less; the first term or highest power freed from its coefficient, by dividing all the terms by it, and all brought to one side, and made equal to nothing on the other side, will appear in this form,

$$x^{n}+ax^{n-1}+bx^{n-2}+cx^{n-3}\ \ldots\ldots=0;$$

then the relations between the roots and coefficients, are as follow:

1st. The coefficient a of the 2d term, is equal to the sum of all the roots.

2d. The coefficient b of the 3d term, is equal to the sum of all the products of the roots that can be made by multiplying every two of them together. In like manner,

3d. The coefficients c, d, e, &c. of the following terms, are respectively equal to the sum of the products of the roots made by multiplying every three together, or every four together, or every five together, &c. the signs of all the roots being changed. All which will appear in the generation of equations.

4th. The roots of equations are positive or negative, and real or imaginary. Thus, the two roots of the equation $x^2-4x=-3$, are 1 and 3, real and both positive; but the roots of the equation $x^3-4x^2-11x=-30$, are 2, 5, & -3, which are real, two positive and one negative; and the roots of the equation $x^3+9x=10$, are 1 and $-\frac{1}{2}\pm\frac{1}{2}\sqrt{-39}$, one real and two imaginary. These imaginary roots always enter equations by pairs.

5th Every equation has as many roots of the form $a\pm\sqrt{\pm b^2}$, as it has dimensions. The first satisfactory proof of this proposition with which we are acquainted is given by Mr. Wood, of St. John's College, Cambridge, in the Phil. Trans. for 1798: or New Abridgement, vol. xviii. p. 341.

Reduction of Equations, is the transforming or changing them to their simplest and most commodious form, to prepare them for finding or extracting their roots. The most convenient form is, that the terms be ranged according to the powers of the unknown letter, the highest power foremost next the left hand, and that term to have only $+1$ for its coefficient: also all the terms containing the unknown letter to be on one side of the equation, and the absolute known term only on the other side.

EQUATION (Recurring). See ALGEBRA, sect. VII.

To find the Roots of Equations, various rules are given, according to the nature of the equation. Thus for a simple equation, having reduced it, by bringing the unknown terms to one side, and the known ones to the other, freeing the former from radicals and fractions, by their counter operations, and lastly, dividing by the coefficients of the unknown quantity, the value of it is then found.

For the roots of quadratics, and equations of higher dimensions, see ALGEBRA, sect VII. BIQUADRATIC, CUBIC, QUADRATIC: consult likewise the articles APPROXIMATION, CONSTRUCTION, DEPRESSION, DIVISORS, EXPEDIENT, EXTERMINATION, IRREDUCIBLE CASE, LIMITS, TRANSFORMATION, &c.

EQUATION (Exponential). See EXPONENTIAL.

EQUATION (Transcendental). See TRANSCENDENTAL.

EQUATION OF PAYMENTS, in arithmetic, is the method of finding a time on which to pay at once several debts due at different times, so that no loss shall be sustained by either party. The rule commonly given is, to multiply each payment by the time at which it is due; and divide the sum of the products by the sum of the payments, for the time required. But this rule is not accurate, as was first shewn, we believe, by Mr. Malcolm, who gave a true rule for *two* payments at simple interest. When three or more payments are to be equated for, it would not be easy, if possible, to give general rules or theorems, on account of the variation of the debts and times, and the difficulty of finding between which of the payments the equated time would fall. Malcolm's rule for two payments is well stated at p. 140 of Mr. Bonnycastle's Arithmetic.

EQUATION, in astronomy, is generally equivalent to correction: an equation is that which is applied to the mean position, or time, of a body, to obtain its true position, or time. In this sense astronomers speak of the annual equation of the sun and moon, and the equation of the moon's mean motion.

EQUATION TO CORRESPONDING ALTITUDES, is a correction which must be applied to the apparent time of noon, (found by means of the interval of time elapsed between the instants when the sun had equal altitudes, both before and after noon,) in order to ascertain the true time. Tables of equations to corresponding altitudes, by the late Mr. Wales, are given in the Nautical Almanac for 1773; also, in his Tract on finding the Longitude by Timekeepers. For Dr. Rittenhouse's ingenious method of finding the equation independent of tables, see the article ALTITUDE INSTRUMENT.

EQUATION OF THE CENTRE, called also *Prosthaphæresis*, and *Total Prosthaphæresis*, is the difference between the true and mean place of a planet, or the angle made by the lines of the true and mean place; or, which amounts to the same, between the mean and equated anomaly.

The greatest equation of the sun's centre may be obtained by finding the sun's longitude at the times when he is near his mean distances, for then the difference will give the true motion for that interval of time: next find the sun's mean motion for the same interval of time; then half the difference between the true and mean motions will shew the greatest equation of the centre.

When the mean anomaly and excentricity of an orbit are given, the equation of the centre may be readily obtained by the following admirable rule given by Mr. T. Simpson. As radius, to the cosine of the given anomaly, so is ¾ of the excentricity of the orbit, to a fourth number; which number add to half the greater axis, if the anomaly be less than 90° or more than 270°, otherwise subtract from the same: Say, as the sum or remainder, is to double the excentricity, so is the logarithmic sine of the given anomaly. to the sine of a first arch, from three times which sine deduct the double radius, the remainder will be the sine of a second arch, whose ⅓ part, taken from the former, leaves the equation sought. See Essays, p. 47.

Mr. Euler has particularly considered this subject in Mem. de l'Acad. de Berlin, tom. ii. p. 225. seq. where he solves the following problems:

1. To find the true and mean anomaly corresponding to the planet's mean distance from the sun; that is, when the planet is in the extremity of the conjugate axis of its orbit.

2. The excentricity of a planet being given, to find the excentric anomaly corresponding to the greatest equation.

3. The excentricity being given, to find the mean anomaly corresponding to the greatest equation.

4. From the same data to find the true anomaly corresponding to this equation.

5. From the same data to find the greatest equation.

6. The greatest equation being given to find the excentricity. Mr. Euler observes, that this problem is very difficult, and that it can only be solved by approximation and tentatively in the manner he mentions; but, if the excentricity be not great, it may be then found directly from the greatest equation. Thus, if the greatest equation $=m$, and the excentricity $=n$, then,

$$m=2n+\frac{11}{2^4 3}n^3+\frac{593}{2^6 3.5.7}n^5+\&c.$$

Whence, by reversion,

$$n=\tfrac{1}{2}m-\frac{11}{2^8 3}m^3-\frac{587}{2^{10}3.5}m^5-\&c.$$

Where the greatest equation m, must be expressed in parts of the radius, which may be done by converting the angle m into seconds, and adding 4,6855749 to the logarithm of the resulting number, this will be the logarithm of the number m.

The mean anomaly to which this greatest equation corresponds will be

$$x=90^\circ+\frac{5}{8}m-\frac{5}{2^9.3}m^3-\frac{1}{2^9.5}m^5-,\ \&c.$$

Whence, if to 90° we add $\frac{5}{8}$ of the greatest equation, we shall sufficiently approximate to this mean anomaly.

Mr. Euler gives us a table, in which may be found the greatest equations, the excentric and mean anomalies corresponding to these greatest equations for every hundredth part of unity, which he supposes equal to the greatest excentricity, or when the distance of the foci and the transverse axis become infinite The last column of his table also gives us the logarithm of that distance of the planet from the sun where its equation is greatest. By the help of this table, any excentricity being given, we may find the greatest corresponding equation by interpolation. But the principal use of the table is to determine the excentricity when the greatest equation is known: and without this help, Mr. Euler thinks the problem cannot be resolved.

Equation of time, in astronomy, denotes the difference between mean and apparent time, or the reduction of the apparent unequal time, or motion of the sun or a planet, to equable and mean time, or motion.

If the earth had only a diurnal motion, without an annual, any given meridian would revolve from the sun to the sun again, in the same quantity of time as from any star to the same star again; because the sun would never change his place with respect to the stars. But, as the earth advances almost a degree eastward in its orbit in the time that it turns eastward round its axis, whatever star passes over the meridian on any day with the sun, will pass over the same meridian on the next day when the sun is almost a degree short of it; that is, 3 minutes 56 seconds sooner. If the year contained only 360 days, as the ecliptic does 360 degrees, the sun's apparent place, so far as his motion is equable, would change a degree every day; and then the sidereal days would be 4 minutes shorter than the solar.

The equation of time is calculated by tracing out the effects of three combined causes; the obliquity of the ecliptic, the sun's unequal apparent motion therein, and the precession of the equinoctial points: in consequence of the first of these, in the first and third quadrants of the ecliptic from aries, that is, between aries and cancer, and between libra and capricorn, the right ascension being less than the mean longitude, the point of right ascension is to the west, and therefore the apparent noon precedes the mean noon; but in the second and fourth quadrants, namely, between cancer and libra, or capricorn and aries, the right ascension being greater than the longitude, or the mean motion taken in the equator, the mean noon is westward, and therefore precedes the apparent noon. But, even if the plane of the ecliptic coincided with that of the equator, there would be a correction necessary; for the apparent annual motion of the sun being not quite uniform, a longer arc would be described in some days than others; that is, since the right ascension and longitude would in this case be the same, the daily increments of right ascension would be unequal. And besides these, the third cause ought to be attended to, though it is too frequently disregarded. The equation of time is, in fact, equal to the difference of the sun's true right ascension and his mean longitude, corrected by the equation of the equinoxes in right ascension. This was, we believe, first shewn by Dr Maskelyne.

The mean and apparent solar days are never equal, except when the sun's daily motion in right-ascension is 59′ 8″; this is nearly the case about April 15th, June 15th, September 1st, and December 24th: on these days the equation is nothing, or nearly so: it is at the greatest about November 1st, when it is 16′ 14″.

Tables of the equation of time, as computed by Dr. Maskelyne's rule for the noon of each day, are given in the Nautical and other Almanacs. Sometimes they are computed for every degree of the sun's place in the ecliptic: as in O. Gregory's and Ewing's Astron. But tables of this latter kind will not answer accurately for many years, because of the precession, the motion of the sun's apogee, &c. which render a frequent revision of the calculations necessary: we, therefore, give no such table in this work.

Timekeepers used by astronomers and mariners are, very properly, regulated by the equation of time: but we conceive there is an impropriety in regulating clocks by this equation, which are intended to shew the time of the day to persons engaged in the common concerns of life. Two instances only will, we think, shew the justice of this remark. 1. During the greater part of November, the equation of time is more than 15′ subtractive, or, the clock after the sun more than a quarter of an hour, if this equation be attended to: in consequence of this, the sun, according to the time shewn by the clock, sets ¼ of an hour sooner than it does in reality; thus the day is made to appear shorter than it is in fact, and gives rise to the common complaint of the dark days before Christmas. Again, 2dly, in February the clocks regulated by the equation of time, are nearly ¼ of an hour before the sun; and thus occasions the delusion of the mornings being unusually short, while the afternoons are comparatively long. If, instead of this, the clocks were always made to correspond with a good dial, such kind of mistaken inferences would be done away; as the real time of the sun's rising and setting would always be truly shewn by the clock.

Equation of a Curve, is an equation shewing the nature of a curve by expressing the relation between any absciss and its corresponding ordinate, or the relation of their fluxions, &c. Equations are not true definitions of a curve, but only artificial or analytical expressions, by the help of which we may proceed with much ease in the investigation of the various properties of curves. See Absciss, Curve, Conics, Cardioid, &c.

Suppose we wished to deduce a general equation to a circle, that, for example, described from the centre A, (fig. 8. Pl. 57.) and with a radius equal to the line AD. The points in the circumference of this circle are distinguished from all other points in the same plane, by being at a distance from the centre A equal to AD; and consequently, wherever we assume the point M on that curve, the right lines AP, and PM, will be sides of a right angled triangle, whose hypothenuse AM is equal to AD. Making, therefore, $AP=x$, $PM=y$, $AD=r$, we have $x^2+y^2=r^2$; whence we find $y=\sqrt{r^2-x^2}$, an equation which shews that when x or AP is known we can find by computation, and without its being necessary to construct the figure, y or PM, or, at least, the relation of that line with the radius. Making, for instance, $x=\frac{1}{3}r$, it will be $y=\sqrt{r^2-\frac{1}{9}r^2}=\sqrt{\frac{8}{9}r^2}=\frac{2}{3}r\sqrt{2}$.

It is easy to conceive that we may deduce from the same original expression the lines PM corresponding to all assumed points of the line AB, comprized between A and D. The equation $y=\sqrt{r^2-x^2}$, proves also, as well as the geometrical description of the circle, that this curve cannot extend beyond the point D: for, that the point P may be beyond D it is requisite that x be greater than AD, or than r; in which case y would become imaginary.

Though we have only considered the quadrant DE, the three others which together with this complete the circumference are comprehended in the equation $x^2+y^2=r^2$: for the ordinate y having for the same value of x, two values, namely $+\sqrt{r^2-x^2}$ and $-\sqrt{r^2-x^2}$, the second must be transferred to the side opposite the former; and will of consequence supply all the points of the quadrant DE′. But we may likewise assign negative values to x, which will direct it from A to D′, since the positive values were estimated from A towards D; to each of these values will answer two values of y: the positive value will give the points of the quadrant D′E, and the negative value the points of the quadrant D′E′.

Right lines as well as curves, may be represented by algebraic equations. Suppose, for example, that the equation $ay-bx-cd=0$, was given, and that the locus was required. Since

$y=\frac{bx+cd}{a}$, it follows that, APM (fig. 9, Pl. 57.) being a right angle, if we draw AN making the angle NAP such that its cosine be to its sine as a to b; and drawing AD parallel to the ordinates PM, and equal to $\frac{cd}{a}$, through D we draw the right-line DF parallel to AN, DF will be the locus required. Where we are so take AD on the same side of the line AE with PN, if bx and cd have the same sign; but on the contrary side of AE, if they have contrary signs.

EQUATOR, in geography, a great circle of the earth, perpendicular to its axis, and equidistant from its two poles. It divides the earth into two hemispheres, one north, the other south. It passes through the east and west points of the horizon, and at the meridian is raised as much above the horizon as is equal to the complement of the latitude of the place. From this circle, the latitudes of places, whether north or south, begin to be reckoned, in degrees of the meridian. The longitudes of places are reckoned in degrees of this circle; and, as the natural day is measured by one revolution of the equator, it follows that one hour answers to $\frac{360}{24}=15$ degrees. Hence, one degree of the equator is equivalent to 4 minutes of time, 15 minutes of a degree to 1 minute of time, and 1 minute of a degree to 4 seconds of time. All people living on this circle, called by mariners the line, have their days and nights constantly equal. The circle formed by extending the plane of the equator to the imaginary concave surface of the heavens is sometimes called the celestial equator, but more properly the equinoctial

EQUATORIAL, Universal, or Portable Observatory, is an instrument intended to answer a number of useful purposes in practical astronomy, independent of any particular observatory. It may be employed in any steady room or place, and it performs most of the useful problems in the science.

The principal parts of this instrument are, 1st. The azimuth or horizontal circle, which represents the horizon of the place, and moves on a long axis, called the vertical axis. 2d, The equatorial or hour-circle, representing the equator, placed at right angles to the polar axis, or the axis of the earth, upon which it moves. 3d, The *semicircle of declination, on which the telescope* is placed, and moving on the axis of declination, or the axis of motion of the line of collimation. *Which circles are measured and divided as in the* following table:

Measures of the several circles and divisions on them.	Radius Inches.	Limb divided to	Non. of 30 gives seconds	Divid. on limb into pts. of Inc.	Divid. by Non. into pts. of Inc
Azimuth or horizontal circle	5·1	15′	30″	45th	1350th
Equatorial or hour circle	5·1	15′ or 1 m in time	30″ 2″	45th	350th
Vertical semicircle for declination or latitude	5·	15′	30″	42d	1260th

The peculiar uses of this equatorial are, 1. To find the meridian by one observation only. For this purpose, elevate the equatorial circle to the co-latitude of the place, and set the declination-semicircle to the sun's declination for the day and hour of the day required; then move the azimuth and hour circles both at the same time, either in the same or contrary direction, till you bring the centre of the cross hairs in the telescope exactly to cover the centre of the sun; when that is done, the index of the hour-circle will give the apparent or solar time at the instant of observation; and thus the time is gained, though the sun be at a distance from the meridian; then turn the hour-circle till the index points precisely at 12 o'clock, and lower the telescope to the horizon, in order to observe some point there in the centre of the glass, and that point is the meridian mark found by one observation only; the best time for this operation is three hours before or three hours after 12 at noon.

2. To point the telescope on a star, though not on the meridian, in full day-light. Having elevated the equatorial circle to the co-latitude of the place, and set the declination-semicircle to the star's declination, move the index of the hour-circle till it shall point to the precise time at which the star is then distant from the meridian, found in tables of the right ascension of the stars, and the star will then appear in the glass. Besides these uses peculiar to this instrument, it is also applicable to all the purposes to which the principal astronomical instruments, viz. a transit, a quadrant, and an equal altitude instrument, are applied.

For a full description of an equatorial invented by Mr. Short, see Phil. Trans. vol. 46; and for one invented by Mr. Nairne, vol. 61. See also Hutton's Math. Dict., English Encyclopædia, and Vince's Practical Astron.

EQUATO'RIAL. *a.* (from *equator.*) Pertaining to the equator (*Cheyne*).

EQUERY, or **ECURY,** a grand stable or lodge for horses, furnished with all the conveniences thereof; as stalls, manger, rack, &c.

EQUERRY, an officer in the king's household, under the sole direction of the master of the horse. There are five equerries, one of whom by way of pre-eminence is called the first: of the other four, two are always in waiting to attend the king in every equestrian excursion, whether on the road, to the field, or in the chase. The prince of Wales, the dukes of York, Clarence, and other branches of the royal family, have attendants of the same description.

The term equerry applies equally to those in a subordinate situation, who personally officiate in the stables of the crown, and to whom are entrusted the breaking, managing, and preparing saddle-horses of every description for the king's use. Some of the out-riders who attend upon the royal family pass also under the same denomination.

EQUES AURATUS, in antiquity, a knight bachelor.

EQUESTRIA, a place in the Roman theatre where the equites or knights sat.

EQUE'STRIAN. *a.* (*equestris,* Latin.) 1. Being on horseback (*Spectator*). 2. Skilled in horsemanship. 3. Belonging to the second rank in Rome.

EQUESTRIAN GAMES, among the Romans, horse-races, of which there were five kinds; the prodromus, or plain horse-race, the chariot-race, the decursory-race about funeral piles, the ludi sevirales, and the ludi neptunales.

EQUIANGULAR, in geometry, an epithet given to figures, whose angles are all equal: such are a square, an equilateral triangle, &c.

EQUICRURAL. (from *æquus* and *crus.*) In geometry, having legs of an equal length: isosceles.

EQUIDIFFERENT. *a.* Is applied in mathematics to such things as have equal differences, or form an arithmetical progression.

EQUICULUS, in astronomy. See **EQUULEUS.**

EQUICURVE CIRCLE. See **CIRCLE OF CURVATURE.**

EQUIDI'STANT. *a.* (*æquus* and *distans,* Lat.) Being at the same distance (*Ray*).

EQUIDI'STANTLY. *ad.* (from *equidistant.*) At the same distance (*Brown*).

EQUIFO'RMITY. *s.* (*æquus* and *forma.* Lat.) Uniform equality (*Brown*).

EQUILATERAL FIGURE, is one that has all its sides equal to each other. Such a the square, and all the regular figures or polygons.

EQUILATERAL HYPERBOLA, is that which has the two axes equal to each other, and every pair of conjugate diameters also equal to each other. The asymptotes also are at right angles to each other, and make each half a right angle with either axis. Also, such an hyperbola is equal to its opposite hyperbola, and likewise to its conjugate hyperbola; so that all the four conjugate hyperbolas are mutually equal to each other.

To EQUILI'BRATE. *v. a.* (from *equilibrium.*) To balance equally (*Boyle*).

EQUILIBRA'TION. *s.* (from *equilibrate.*) Equipoise (*Derham*).

EQUILIBRATION (Arch of.) See ARCH.

EQUILI'BRIUM. (Latin.) *s.* 1. Equipoise; equality of weight. 2. Equality of evidence, motives, or powers, of any kind.

EQUILIBRIUM, in mechanics, is an equality of weights, powers, or forces of any sort. Bodies at rest are in a state of equilibrium, when they are solicited by various forces in different directions, in such a manner as to be completely balanced, and have no tendency to move in any direction. Bodies in motion are in a state of equilibrium, when the resistance to motion, and the power producing it, are so adjusted, that the result shall be uniform motion. The former of these has been called statical, the latter dynamical, equilibrium: an accurate knowledge of both kinds is indispensably necessary in the theory and practice of mechanics.

EQUIMULTIPLES, in arithmetic and geometry, numbers or quantities produced by multiplying others equally. Thus 3A and 3B, are equimultiples of the quantities A and B: $x\sqrt{m}$, $y\sqrt{m}$, are equimultiples of x and y. Equimultiples of any quantities have the same ratio as the quantities themselves.

EQUINE'CESSARY. *a.* (*æquus* and *necessarius*, Lat.) Needful in the same degree (*Hudibras*).

EQUINOCTIAL, a great circle in the heavens, under which the equator moves in its diurnal motion. The poles of this circle are the poles of the world. It divides the sphere into two equal parts, the northern and southern. The equinoctial has various properties; as,

1. Whenever the sun comes to this circle, he makes equal days and nights all round the globe; because he then rises due east, and sets due west. Hence it has the name equinoctial. All stars which are under this circle, or have no declination, do also rise due east, and set due west.

2. All people living under this circle, or upon the equator, or line, have their days and nights at all times equal to each other.

3. From this circle on the globe, is counted, upon the meridian, the declination in the heavens, and the latitude on the earth.

4. Upon the equinoctial, or equator, is counted the longitude, making in all 360° quite round, or else 180° east, and 180° west.

5. The shadows of those people who live under this circle are cast to the southward of them for one half of the year, and to the northward of them during the other half; and twice in a year, viz. at the time of the equinoxes, the sun at noon casts no shadow, being exactly in their zenith.

EQUINOCTIAL COLURE, is the great circle passing through the poles of the world and the equinoctial points, or first points of Aries and Libra.

EQUINOCTIAL DIAL, is one whose plane is parallel to the equinoctial. The properties or principles of this dial are,

1. The hour lines are all equally distant from one another, quite round the circumference of a circle; and the style is a straight pin, or wire, set up in the centre of the circle, perpendicular to the plane of the dial.

2. The sun shines upon the upper part of this dial-plane from the 21st of March to the 23d of September, and upon the under part of the plane the other half of the year.

EQUINO'CTIAL. *a.* (from *equinox.*) 1. Pertaining to the equinox (*Milton*). 2. Happening about the time of the equinoxes. 3. Being near the equinoctial line (*Philips*).

EQUINO'CTIAL FLOWERS, in botany, opening at a regular stated hour. See VIGILIÆ.

EQUINOCTIAL POINTS, are the two points wherein the equator and ecliptic intersect each other: the one being in the first point of Aries, is called the vernal point; and the other in the first point of Libra, the autumnal point.

EQUINO'CTIALLY. *ad.* In the direction of the equinoctial (*Brown*).

EQUINOX, in astronomy, the time when the sun enters one of the equinoctial points. The equinoxes happen when the sun is in the equinoctial circle; when of consequence the days are equal to the nights throughout the world, which is the case twice a year, viz. about the 21st of March and the 23d of September, the first of which is the vernal, and the second the autumnal equinox. It is found by observation, that the equinoctial points, and all the other points of the ecliptic, are continually moving backward, or *in antecedentia*, that is, westward. This retrograde motion of the equinoctial points, is that famous and difficult phenomenon called the *precession of the equinoxes*.

EQUINU'MERANT. *a.* (*æquus* and *numerus*, Lat.) Having the same number (*Arbuthnot*).

To EQUI'P. *v. a.* (*equipper*, French.) 1. To furnish for a horseman or cavalier. 2. To furnish; to accoutre; to dress out.

E'QUIPAGE. *s.* (*equipage*, French.) 1. Furniture for a horseman. 2. Carriage of state; vehicle (*Milton*). 3. Attendance; retinue (*Pope*). 4. Accoutrements; furniture.

E'QUIPAGED. *a.* Accoutred; attended (*Spenser*).

EQUIPE'NDENCY. *s.* (*equus* and *pendeo*, Lat.) The act of hanging in equipoise (*South*).

EQUI'PMENT. *s.* (from *equip.*) 1. The act of equipping or accoutring. 2. Accoutrement; equipage.

E'QUIPOISE. s. (*equus*, Lat. and *poids*, Fr.) Equality of weight; equilibration (*Glanville*).

EQUIPO'LLENCE. *s.* (*æquus* and *pollentia*, Lat.) Equality of force or power.

EQUIPO'LLENT. *a.* (*æquipollens*, Lat.) Having equal power or force (*Bacon*).

EQUIPO'NDERANCE. EQUIPO'NDERANCY. *s.* (*æquus* and *pondus*, Lat.) Equality of weight; equipoise.

EQUIPO'NDERANT. *a.* (*æquus* and *ponderans*, Lat.) Being of the same weight (*Ray*).

To EQUIPO'NDERATE. *v. n.* (*æquus* and *pondero*, Latin.) To weigh equal to another thing (*Wilkins*).

EQUI'PONDIOUS. *a.* (*æquus* and *pondus*, Latin.) Equilibrated; equal on either part: not in use (*Glanville*).

EQUISE'TUM, in medicine. (*equisetum*, from *equus*, a horse, and *seta*, a bristle, so named from its resemblance to a horse's tail.) Cauda equina. The plant directed for medicinal purposes under this name is the hippuris vulgaris of Linnéus. It possesses adstringent qualities, and is frequently used by the common people as tea in diarrhœas and hæmorrhages. The same virtues are also attributed to the equisetum arvense, fluviatile limosum, and other species, which are directed indiscriminately by the term equisetum. See HIPPURIS.

EQUISE'TUM. Horse-tail. In botany, a genus of the class cryptogamia, order musci. Ament composed of peltate scales, flowering on the inside; involucels two-valved; seeds numerous, naked, enfolded by four pollen-bearing filaments. Eight species; six of them common to our own country, and found in our woods, corn-fields, moist places, or banks of stagnant waters. E. hyemale, shave-grass, or Dutch rushes, contains in its leaves a considerable portion of flinty or siliceous matter, and is hence employed by whitesmiths and cabinet-makers for polishing their metals and wood. Most of the species contain something of the same property; and are employed by the dairy maids of the north to scour their milk-pails with.

EQUISONANT, in music. See ÆQUISONANT.

E'QUITABLE. *a.* (*equitable*, French.) 1. Just; due to justice (*Boyle*). 2. Loving justice; candid; impartial.

E'QUITABLY. *ad.* Justly; impartially.

EQUITANGENTIAL CURVE, a curve first constructed by Mr. J. Perks, the tangent of which is always equal to a constant line. It is the involute of the catenaria. For the various properties of this curve, its mechanical construction, its use in dividing the meridian in Mercator's projection, and its relation to the catenaria, we refer to Phil. Trans. No. 345. See also Mr. Brougham's Paper on Prisms, in the Phil. Trans. vol. lxxxviii. or New Abridgement, vol. xviii. p. 354, for other curious properties of this curve. It is the curve of traction to a straight line.

EQUITANT LEAVES, in botany, riding as it were over each other. Quum folii latera parallele connivent, ut interiora ab exterioribus includantur; quod non in conduplicatis obtinet. Philos. Bot. When the sides of a leaf converge in parallel lines, so that the inner leaves are inclosed by the outer ones: which is not the case in conduplicate leaves. When two opposite leaves so converge to each other with their edges, as that one incloses the other; as in iris, hemerocallis, acorus, carex, gramina.

EQUITATION. See HORSEMANSHIP.

EQUITES, persons of the second degree of Roman nobility, immediately succeeding the senators in point of rank.

E'QUITY. *s.* (*equité*, French.) 1. Justice; right; honesty (*Tillotson*). 2. Impartiality (*Hooker*). 3. (In law.) The rules of decision observed by the court of chancery.

EQUITY OF REDEMPTION, on mortgages, is that right which a mortgager has of redeeming his estate upon payment of the money borrowed. If where money is due on a mortgage, the mortgagee is desirous to bar the equity of redemption, he may oblige the mortgagor either to pay the money, or be foreclosed of his equity, which is done by proceedings in the court of chancery. But the chancery cannot shorten the time of payment of the mortgage money, where it is limited by express covenant, though it may lengthen it; and then upon non-payment, the practice is to foreclose the equity of redemption of the mortgagor. 2 Vent. 364.

EQUITY, in mythology, sometimes confounded with Justice, a goddess among the Greeks and Romans, represented with a sword in one hand and a balance in the other.

EQUI'VALENCE. EQUI'VALENCY. *s.* (*æquus* and *valeo*, Lat.) Equality of power or worth (*Smalridge*).

To EQUI'VALENCE. *v. a.* (from the noun.) To equiponderate, to be equal to (*Brown*).

EQUI'VALENT. *a.* (*æquus* and *valens*, Lat.) 1. Equal in value (*Prior*). 2. Equal in any excellence (*Milton*). 3. Equal in force or power (*Milton*). 4. Of the same cogency or weight (*Hooker*). 5. Of the same import or meaning (*South*).

EQUI'VALENT. *s.* A thing of the same weight, dignity, or value (*Rogers*).

EQUI'VOCAL. *a.* (*æquivocus*, Latin.) 1. Of doubtful signification; meaning different things (*Stil.*). 2. Uncertain; doubtful (*Ray*).

EQUIVOCAL CHORDS, in music, those whose fundamental bass is not indicated by the intervals which form it.

EQUIVOCAL GENERATION, a method whereby animals and plants are supposed to be produced, not by the usual way of coition between male and female, but by some supposed plastic power or virtue in the sun, or what are called *formative atoms*.

Thus insects, maggots, flies, spiders, frogs, &c. have usually been supposed to be produced by the heat of the sun warming, agitating, and impregnating the dust, earth, mud, and putrified parts of animals.

This method of generation, which we also call spontaneous, was commonly asserted and believed among the ancient philosophers; but the moderns, from more and better observations, unanimously reject it, and hold that all animals, nay, and vegetables too, are univocally produced; that is, from parent animals, and vegetables of the same species and denomination.

Equi'vocal. *s.* Ambiguity (*Dennis*).

EQUI'VOCALLY. *ad.* (from *equivocal.*) 1. Ambiguously; in a doubtful or double sense. (*South*). 2. By uncertain or irregular birth; by generation out of the stated order (*Bentley*).

EQUI'VOCALNESS. *s.* (from *equivocal.*) Ambiguity; double meaning (*Norris*).

To **EQUI'VOCATE.** *v. n.* (*æquivocatio*, Lat.) To use words of double meaning; to use ambiguous expressions (*Smith*).

EQUIVOCA'TION. *s.* (*æquivocatio*, Lat.) Ambiguity of speech; double meaning (*Hooker*).

EQUIVOCA'TOR. *s.* (from *equivocate.*) One who uses ambiguous language (*Shakspeare*).

EQUULEUS, or **Ecculeus**, in antiquity, a kind of rack used for extorting confession: at first chiefly practised on slaves, but afterwards on Christians. It was originally constructed in the form of a horse; the sufferer was laid on his back, and his arms were turned under the breast of the equuleus, his hands were bound, and his feet stretched out towards his tail. A rope fastened to the feet, was made to pass over a smaller pulley between the hind-legs of the equuleus, and made to coil over another larger pulley fixed under the belly by means of a handle, which the executioner turned round till all the bones, &c. were dislocated.

Equuleus, Equus minor, the Horse's Head, in astronomy, an old northern constellation, consisting of twelve stars of the first six magnitudes, i. e. 0. 0. 0. 4. 1. 7.

Equuleus pictorius, the Painter's Easile, in astronomy, a new southern constellation. It contains seventeen stars of the first six magnitudes, i. e. 0. 0. 0. 2. 6. 9.

EQUUS, in zoology, a genus of the class mammalia, order belluæ. Fore-teeth, upper six, erect parallel; lower, six more prominent; tusks solitary, included, remote; teats two, inguinal. The most noble, most interesting, and most useful of all quadrupeds, possessing with the greatest grandeur of stature, the greatest elegance and proportion of parts. The animals of this invaluable tribe are used for draught, burden, and the saddle; fight by biting and kicking with the hind-feet: in the male the teats are situated on the glans penis; and they have the singular property of breething only through the nostrils, and not through the mouth. Six species, as follow:

1. E. caballus. Horse. Hoofs solid; mane and tail with long flowing hair. The horse is composed of two varieties, the *wild* and the *domestic*.

It is cultivated with care in most parts of the earth; but is found in its natural state in the deserts of Great Tartary; sometimes in Africa: timid, swift, vigilant; moves in flocks, having a leader before with his ears thrown forwards, and a centinel behind, with his ears bent back, to guard against surprize both ways. It varies much in size and colour; feeds on grain and herbage; generous, proud, spirited; drives away flies and insects with its tail; carefully guards its hind parts; calls after its companion by neighing; and scratches its shoulder with its teeth; rolls itself when hot; is without gall-bladder, but has large gall ducts to answer the purpose; does not vomit or eructate; its dung heats and smokes; changes its fore-teeth in the second, third, and fourth years; acquires tusks in the fifth; gravid two hundred and ninety days.

Upon the several varieties or breeds of equus caballus; or horse, see the articles Cart-horse, Race-horse, Hunter, &c.

In the present article we can only be general, and shall, therefore, observe in the language of Dr. Shaw, for we cannot possibly employ better, that "of the several breeds of horses in common or general use in Europe, it is remarkable that none can come in competition with those of our own island, either for the strength required in laborious services, or for the swiftness and elegance of such as are bred for the course. The annals of Newmarket record instances of horses that have literally outstripped the wind, as is proved from accurate calculations. The celebrated Childers is commemorated in particular as the swiftest of his tribe, and the instances of his speed may be found in various publications. He was known to have run near a mile in a minute; and to have cleared the course at Newmarket, which is only four hundred yards short of four miles, in six minutes and forty seconds; running at the rate of eighty-two feet and a half in the space of a second. Of nearly equal fame is the character of Eclipse, whose strength was said to be greater, and whose swiftness scarcely inferior. This latter animal forms the subject of M. Sainbel's calculations, who in his work on the veterinary art has given an elaborate and curious description of his several proportions. It is remarkable that this horse was never esteemed handsome, though the mechanism of his frame, so far as regarded his powers of swiftness, was almost perfect." M. Sainbel has given an accurate table of the relative proportions of a horse perfect in every respect; and whoever compares the proportions of Eclipse as they are commonly exhibited in drawings and descriptions of him will discover the following differences.

1. In that table the horse should measure three heads in height, counting from the foretop to the ground. Eclipse measured upwards of three heads and a half.

2. The neck should measure but one head

in length; that of Eclipse measured a head and a half.

3. The height of the body should be equal to its length; the height of Eclipse exceeded his length by about an inch.

4. A perpendicular line falling from the stifle should touch the toe; this line in Eclipse touched the ground at the distance of half a head before the toe.

5. The distance from the elbow to the bend of the knee should be the same as from the bend of the knee to the ground; these two distances were unequal in Eclipse, the former being two parts of a head longer than the latter.

This summary comparison shows that the beauty of a horse cannot be absolutely determined by general rules, but must ever be in relation to a particular species.

2. E. hemionus. Wild mule. Jicta. Hoofs solid; colour uniform; without cross on the back; tail hairy at the tip only: head large, narrowing towards the nose; neck slender; hair soft; face tawny; nose white towards the end; body above brownish; beneath and towards the buttocks white; along the back a blackish list; tuft on the tail black; teeth thirty-four.

Inhabits the desarts of Arabia and China, in grassy, saline plains, but avoids woods and snowy mountains; timid, swift, not tameable; hearing and smell acute; neighing more sonorous than that of the horse; in size and habits resembles a mule; in ears and tail a zebra; hoofs and body an ass; limbs a horse: five feet in length. This species is supposed by Pallas to have been intended by Aristotle under the name hemionus; whence he has applied this term to its specific distinction. In the days of Aristotle it was supposed to inhabit Syria; and is mentioned by Pliny from Theophrastus as found also in Cappadocia. Its native name among the Mongalians is Dshikketaei; among the Chinese Yo-to-tse.

3. E. asinus. Ass. Hoofs solid; tail bristly at the extremity; a black cross on the shoulder of the male. Four varieties:

- α. Mane woolly, dusky; ears long, erect; forehead much arched: constituting the Wild ass.
- β. Mane short; ears long, slouching; forehead flattish. Domestic ass.
- γ. Hybrid; produce of a male ass and a horse. Mule.
- δ. Hybrid; produce of a horse and a female ass. Hinny.

As a general character we may observe that the ears are large, flaccid; mane short; body cinereous. The domestic ass is swifter than in its wild state, as well as more active; hunts wild animals; acute in hearing and sight; loves salt and bitter herbs: its flesh is eaten by the Kirgisees; the skin growing on the rump is made into chagrin; lives thirty years; and like the horse is gravid two hundred and ninety days.

The mule is much cultivated in Spain; where its size is nearly that of a horse. The hinny is much less, of a redder colour, with the ears of a horse; mane and tail of an ass.

Inhabits the mountainous desarts of Tartary: whence it annually migrates to India and Persia. It is found also, in its natural state, in various parts of Syria, Arabia, and Africa: is domesticated almost every where; loves warmth; is patient of hunger and stripes, feeds on thorns and thistles; is slothful, slow, stupid, and lascivious.

Yet such does not appear to have been the character of the wild ass in earlier times; in which this tribe was in far more repute than at present; and was accounted the chief part of the patriarchal store, as well as made companions of some of the principal deities of the Gentile world. The Hebrew פרא, (ονος αγριος, or οναγρος, onager as it is translated by the Septuagint) is always spoken of with respect in the Hebrew scriptures; and Priapus, though debased by the Romans, was esteemed the same as Pan, and styled πρωτογονος, as being the first of deified mortals. Near his statue was often described the figure of an ass. Asses are continually introduced in the histories of Bacchus and Silenus; these deities are peculiarly represented as being carried upon them: asses were placed in the celestial sphere, and were supposed, as asterisms, to have had a propitious influence. At Athens they were particularly employed in the mysteries of Ceres to bear the sacred vessels, and whatever belonged to those solemn rites at the festival. See Nat. Hist. Pl. XCII. XCIII.

4. E. zebra. Zebra. Hoofs solid; body pale buff, with perpendicular brown bands; the limbs with cross stripes. Inhabits in troops the plains of Southern Africa; is extremely beautiful but malignant; swift; wild; size of a mule; mane short, erect, striate; ears erect; tail like that of an ass.

5. E. quagga. Hoofs solid; body above chesnut, with perpendicular brown stripes; belly, legs, and thighs white without stripes: sides spotted. Inhabits South America in separate tribes; thicker, stouter, and more tameable than the zebra.

6. E. bisulcus. Chinese horse. Cloven-foot horse. Hoofs cloven. Inhabits the rocky mountains of the Corderellas in South America; wild, swift, vicious; neighs like a horse; resembles in size and colour the ass, but wants the shoulder-cross; ears small, erect.

ERA, in chronology. See Æra.

ERADIA'TION. *s.* (*e* and *radius*, Latin.) Emission of radiance (*K. Charles*).

To ERA'DICATE. *v. a.* (*eradico*, Latin.) 1. To pull up by the root (*Brown*). 2. To completely destroy; to end (*Swift*).

ERADICA'TION. *s.* (from *eradicate.*) 1 The act of tearing up by the root; destruction excision. 2. The state of being torn up by the roots.

ERA'DICATIVE. *a.* (from *eradicate.*) That cures radically; that drives quite away.

ERANARCHA, in Grecian antiquity, an

officer who directed the alms and provisions made for the poor.

ERANES, certain societies among the ancient Athenians. Each member had to deposit a fixed sum, monthly, in the common treasury; and this was destined for the relief of associates who laboured under particular misfortunes, towards their support, or the maintenance of their credit in a critical moment. As soon as circumstances would admit of an arrangement, they were obliged to refund the principal sums, but without interest. The Athenians looked upon these societies as very useful among a commercial people, where disappointments and shipwrecks often produced such distresses as could only be relieved by these associations. Many of the ancients, however, condemned them; and indeed they were not long before they were much abused. See De Pauw on the Greeks, vol. i. p. 205—207.

ERANTHEMUM, in botany, a genus of the class diandria, order monogynia. Corol five-cleft with a filiform tube; anthers beyond the tube; stigma simple. Five species; natives of the Cape or some part of Africa; herbaceous or shrubby.

To ERA'SE. *v. a.* (*raser*, French.) 1. To destroy; to exscind (*Peacham*). 2. To expunge; to rub out.

ERA'SEMENT. *s.* (from *erase.*) 1. Destruction; devastation. 2. Expunction; abolition.

ERASMUS (Desiderius), born at Rotterdam in 1467. He lost his father and mother at 14 years of age; and was committed to the care of certain guardians, who would force him to be an ecclesiastic, which he refused for a long time. However, he was obliged to assume the religious habit among the canons regular in the monastery of Stein near Tergou; but afterwards obtained a dispensation from his vows. He was the most learned man of the age in which he lived; and contributed, by his example and his writings, to the restoration of learning in the several countries in which he occasionally resided, viz. Italy, Switzerland, Holland, France, and England: with the last he was most satisfied; and found the greatest encouragement from Henry VIII. sir Thomas More, and all the learned Englishmen of those days. He published a great many books; and died at Basil in 1536. He was buried honourably, and his memory is still held in veneration. He had, however, many enemies; and as he did not embrace the reformation, and yet censured many things on popery, he hath been treated injuriously both by Catholics and Protestants. The works of Erasmus in 10 vols. folio, were published at Leyden in 1706, in a very handsome manner, under the care of M. Le Clerc. Dr. Jortin published his life in one vol. 4to. 1758.

ERASTIANS, a religious sect or faction which arose in England during the time of the civil wars in 1647, thus called from their leader Thomas Erastus, whose distinguishing doctrine it was, that the church had no right to discipline, that is, no regular power to excommunicate, exclude, censure, absolve, decree, and the like.

ERATO. (from ερaω, I love.) In mythology, the name of one of the nine muses who presided over love-poetry. To this muse some have ascribed the invention of the lyre and lute; and she is represented with a garland of myrtles and roses, holding a lyre in one hand and a bow in the other, and at her side a Cupid with his torch. There is also a Nereid of the same name.

ERATOSTHENES, a Greek of Cyrene, who was a librarian of Alexandria, under king Euergetes, son of Ptolemy Philadelphus. He died 194 B.C. He was called the cosmographer, because he was the first who discovered the method of measuring the bulk and circumference of the earth. What remains to us of his writings appeared from the Oxford press, in 1672, 8vo.

The measurement of the earth by Eratosthenes, so much admired in its time, as a prodigy of human sagacity, has been transmitted to us by Cleomedes: Cycl. Theor. book I. chap. 10. Eratosthenes was informed, that at the time of the summer solstice the sun at noon was vertical to the city of Syene, situate on the borders of Ethiopia, under the tropic of cancer. A well is particularly mentioned to have been sunk in this city, which was illuminated throughout its whole depth by the sun at noon on the day of the solstice. He knew likewise, or at least he imagined, and he was not far from the truth, that Alexandria and Syene were both under the same meridian. On these data he constructed a concave hemisphere at Alexandria, from the bottom of which arose a vertical style, terminating at the centre of curvature of the hemisphere. Then, supposing the city of Syene to be in the vertical direction of the style, he observed, that the arc, included between the foot of the style and the extremity of its shadow projected on the concavity of the hemisphere by the meridian sun at the solstice, was equal to a fiftieth part of the whole circumference. Hence he inferred, that the arc of the heavens comprised between Alexandria and Syene must be the same; and that the distance of the two cities must likewise be a similar arc, or a fiftieth part of the whole circumference of a great circle of the earth. Now on measuring this distance, or the length of this arc, it was found to be 5000 stadia, which gave 250,000 stadia for the length of the entire circumference of the earth, and $694\frac{4}{9}$ stadia to a degree. Some later astronomers, desirous of avoiding the fraction, and supposing that it was impossible to answer for the accuracy of the measure to five or six stadia in a degree, extended this length to 700 stadia, which give 252,000 stadia for the measure of the whole circumference. See EARTH.

ERATOSTHENES'S SIEVE. (κοσκινον.) The name given to a contrivance by which that philosopher discovered prime numbers. The method was indirect: the numbers which were not prime were excluded one by one, as though they dropped through a sieve. We shall not give a detailed account of the progress, since it appears inferior to several of the modern methods of ascertaining prime numbers. Those, however, who are curious in these matters, may turn to Dr. Horsley's paper in the Philosophical Transactions for 1772, or to Montucula Histoire des Mathematiques, i. 281.

ERE. *ad.* (ær, Saxon.) Before; sooner than (*Shakspeare*)

ERELO'NG. *ad.* (from *ere* and *long.*) Before a long time had elapsed (*Spenser*).

ERENO'W. *ad.* Before this time (*Dryden*).

EREWHI'LE. **Erewhi'les.** *ad.* Some time ago; before a little while (*Shakspeare*).

ERBACH, a town of Franconia, capital of a county of the same name. It is 20 miles N.E. of Manheim.

EREBUS. (Ἔρεβος, from ערב, night.) In mythology, a term denoting darkness. According to Hesiod, Erebus was the son of Chaos and the night, and the father of the day. This was also the name of part of the inferi among the ancients: they had a peculiar expiation for those who were detained in Erebus. Erebus was properly the gloomy region, and distinguished both from Tartarus the place of torment, and Elysium the region of bliss: according to the account given of it by Virgil, it forms the third grand division of the invisible world beyond the Styx, and comprehends several particular districts, as the limbus infantum, or receptacle for infants: the limbus for those who have been put to death without cause; that for those who have destroyed themselves; the fields of mourning, full of dark groves and woods, inhabited by those who died for love; and beyond these an open champaign country for departed warriors.

To **ERE'CT.** *v. a.* (*erectus*, Latin.) 1. To place perpendicularly to the horizon. 2. To raise; to build (*Addison*). 3. To establish anew; to settle (*Raleigh*). 4. To elevate; to exalt (*Dryden*). 5. To raise consequences from premises (*Locke*). 6. To animate; to encourage (*Denham*).

To **Ere'ct.** *v. n.* To raise upright (*Bacon*).

Ere'ct. *a.* (*erectus*, Latin.) 1. Upright; not leaning; not prone (*Brown*). 2. Directed upward (*Philips*). 3. Bold; confident; unshaken (*Glanville*). 4. Vigorous; not depressed (*Hooker*).

Erect, or Upright, in botany, applied to a stem capable of supporting itself; and is opposed to twining. Hence it does not strictly imply perpendicular or vertical, which is usually expressed by *straight*, *strictus*.

A leaf is said to be erect, when it makes so very acute an angle with the stem as to be close to it. When it makes an acute angle with the stem, it is also said to be patent or spreading.

An erect flower has its aperture directed upwards: as in trillium sessile. Opposed to nutans, nodding.

An erect anther, fixed by one end to the top of the filament; contrasted with versatile and incumbent, which are fixed by the side.

This term is applied also to the petiole, peduncle, and stipule.

ERE'CTION. *s.* (from *erect.*) 1. The act of raising, or state of being raised upward (*Brerewood*). 2. The act of building or raising edifices (*Raleigh*). 3. Establishment; settlement (*South*). 4. Elevation; exaltation of sentiments (*Sidney*). 5. Act of rousing; excitement to attention.

ERE'CTNESS. *s.* Uprightness of posture (*Brown*).

ERECTOR, in anatomy, a term applied to a variety of muscles, whose intention is to upraise or elevate.

Erector clitoridis. First muscle of the clitoris of Douglas. A muscle of the clitoris that draws it downwards and backwards, and serves to make the body of the clitoris more tense, by squeezing the blood into it from its crus. It arises from the tuberosity of the ischium, and is inserted into the clitoris.

Erector penis. A muscle of the penis that drives the urine or semen forwards, and, by grasping the bulb of the urethra, pushes the blood towards the corpus cavernosum and the glans, and thus distends them. It arises from the tuberosity of the ischium, and is inserted into the sides of the cavernous substance of the penis.

E'REMITE. *s.* (*eremita*, Lat. ἐρημίτης.) One who lives in a wilderness; a hermit (*Raleigh*).

EREMI'TICAL. *a.* (from *eremite.*) Religiously solitary (*Stillingfleet*).

ERIPTA'TION. *s.* (*cripto*, Lat.) A creeping forth (*Bailey*).

ERE'PTION. *s.* (*ereptio*, Lat.) A snatching or taking away by force.

ERETHI'SMUS. (*erethismus*, ἐρεθισμὸς, from ἐρεθίζω, to excite or irritate.) Increased sensibility and irritability. It is variously applied by modern writers; but, in general, rather to such eruptions as are plain and efflorescent, than to such as are prominent, and exanthematous.

EREUGMUS. (from ἐρεύγω, to eructate.) Eructation.

EREUXIS. (from ἐρεύγω.) Eructation.

ERFURT, the capital of Thuringia, in Germany. It is the seat of an university, has several libraries, and belongs to the elector of Mentz. About 180 houses were destroyed by fire in 1736. It is 35 miles N. by E. of Coburg. Lat. 51. 0 N. Lon. 11. 23 E.

ERGASTULUM, among the Romans, a house of correction.

ERGOT, in veterinary language, a name given to a stub, like a piece of soft horn, about the bigness of a chesnut, which appears behind and below the pastern joint of a horse, and commonly hid under the tuft of the fetlock. It is to be taken out to the quick with an incision knife, in order to get at a bladder of fluid that lies covered with the ergot. This operation, in Holland, is frequently performed upon all four legs.

ERICA. Heath. Ling. In botany, a genus of the class octandria, order monogynia. Calyx four-leaved; corol four-cleft; stamens inserted on the receptacle; anthers with two pores; capsule superior, four-celled, many-seeded. A hundred and thirty-seven species; chiefly of the Cape and south of Europe, and four of them indigenous to the heaths or moors of our own country. They may be thus sectioned:

A. Anthers awned; leaves opposite.
B. Anthers awned; leaves in threes.
C. Anthers awned; leaves in fours.
D. Anthers awned; leaves six in a whorl.
E. Anthers awned; leaves eight in a whorl.
F. Anthers awned; leaves scattered.
G. Anthers bearded; leaves opposite.
H. Anthers bearded; leaves in threes.
I. Anthers bearded; leaves four in a whorl.
K. Anthers simple; leaves alternate or opposite.
L. Anthers simple; leaves in threes.
M. Anthers beardless; leaves in four or more.

The two last sections the most numerous. The common heaths, e. vulgaris and e. vagaro, are of considerable use, and resorted to for a variety of purposes in many parts of this country. They are very generally employed in making brooms and brushes; serve frequently, and especially in Scotland, for thatching cottages, and often for land-draining, and the construction of the walls of hovels, out-houses, and, when plastered over with mortar, of decent cottages themselves. There is a considerable portion of saccharine matter in the juice of the young shoots, but combined with a peculiar aroma; which last inflames the bladder of cattle not accustomed to it, and induces them to discharge bloody urine; from which, however, they are soon relieved by drinking plentifully of water. The young plant, on account of its saccharine qualities, has been often employed with malt in the brewing of beer: but there are many other wild herbs indigenous to our own soils that might be selected with greater advantage. The sugar and aroma of the flower is very enticing to the bee, who makes a very free use of it, often so free a use as to give a red tinge to the honey she secretes. A great variety of the exotics are found in our green-houses, and largely contribute to their beauty. See Botany, Pl. CIX.

One of the most beautiful species of this captivating tribe is *erica elegans*, elegant erica, a low shrub with short branches growing in every direction. Leaves ternate, but by those of one whorl being placed directly between those of the next, the whole is neatly arranged in six distinct rows, glaucous, fleshy, acerose, channelled underneath. Flowers terminal, in a compact umbel. Involucre of six ovate, acuminate leaves. Peduncles scarcely as long as the involucre, with three or four large bractes similar to the involucre, deciduous. Calyx four-leaved. Nectary a glandular, beaded circle, within the stamens. Stamens included; filaments dilated at both ends, incurved. Anthers oblong, acute, cristate. Germ globosely four-lobed; style erect; stigma capitate, included.

ERIDANUS, one of the largest rivers of Italy, rising in the Alps and falling into the Adriatic by several mouths; now called the Po. Virgil calls it the king of all rivers.

Eridanus, in astronomy, an old southern constellation representing a river. It contains 82 stars of the first six magnitudes, viz. 1. 0. 10. 24. 19. 28.

ERIE LAKE, in North America, lies between 41° and 43° N. lat. and 79° and 84° W. lon. It is 290 miles long, and 40 in its broadest part. Its banks are much infested with rattle-snakes, and other reptiles. This lake, at its N.E. end, communicates with Lake Ontario by the river Niagara.

ERIGENA (John Scotus), a learned man of the 9th century, born, according to the general account, in Scotland. His thirst for knowledge was so great, that he travelled into many countries to improve himself, and according to some he went to Athens, where he acquired the Greek and Oriental languages. Charles the Bald, king of France, invited him to his court, where he lived several years on terms of the greatest familiarity with that munificent prince. He here composed a great number of books, which procured him both friends and enemies. Some of the clergy pretended to have discovered in them the heresy of Pelagius. It is certain that he opposed the doctrine of absolute predestination, and the real presence in the eucharist. At the request of his patron he translated the works of Dionysius into Latin, which drew upon him the resentment of the pope, to avoid the fury of which he left France, and crossed over to England. His greatest work was that on the Division of Nature, or the Nature of Things, of which an edition was printed at Oxford, in 1681, by Dr. Thomas Gale. Some writers say, that Erigena was employed by king Alfred in restoring learning at the university of Oxford, and that he afterwards taught in the abbey of Malmsbury, where he was murdered by his pupils on account of his severity. Others say that he died a natural death in France about 874. (*Watkins.*)

ERIGERON. Flea-bane. In botany, a genus of the class syngenesia, order polygamia superflua. Receptacle naked; down simple: florets of the margin very numerous and narrow as well as linear; calyx imbricate. Thirty-two species; scattered over the globe, of which three are common to the pastures and mountains of our own country.

ERIGERUM. (*erigerum*, ηριγερων; from ηρ, the spring, and γερων, old, so called, because in the spring it has a white blossom like the hair of an old man.) A term for groundsel. This very common plant, senecio vulgaris of Linnéus, is frequently under this name directed to be applied bruised to inflammations and ulcers, as a refrigerent and antiscorbutic.

ERIGONE, in fabulous history, a daughter of Icarius, who hanged herself when she heard that her father had been killed by some shepherds whom he had intoxicated. She was made a constellation, now known under the name of Virgo. Bacchus deceived her by changing himself into a beautiful grape. (*Ovid. Virg.* &c.) A daughter of Ægisthus and Clytemnestra, who had by her brother Orestes, Penthilus, who shared the regal power with Timasenus, the legitimate son of Orestes and Hermione. (*Paus.*)

ERINACEUS. Hedge-hog. In zoology, a genus of the class mammalia, order feræ. Fore-teeth, upper two distant; lower two, approximate; tusks upper, five on each side, lower three; grinders four on each side on each jaw; back and sides covered with spines. Six species, as follow; see Nat. Hist. Pl. XCV.

1. E. euripœus. Common hedgehog. Ears rounded; nostrils with a loose flap; length about ten inches; snout acute; upper lip cleft; eyes small, black; spines at each end yellowish grey; middle blackish; legs short, naked, five-toed; claws weak. Inhabits all Europe, except the utmost north, the southern parts of Siberia, and Madagascar: lives in thickets and hedges; builds its nest of moss, grass, leaves; winters in bushes rolled up; wanders by night; feeds on toads, worms, beetles, cock-roaches, crabs, shell-fishes, fruits, small-birds, and carcasses; digs in mossy places; swims easily; when frightened or angry, rolls itself up and presents its spines on every side; screams if the feet be pressed; is tamed by the Calmucs like the cat; female five teats; three pectoral, two abdominal; brings from three to five young; does not, as is vulgarly supposed, suck cattle; flesh not eatable.

2. E. inauris. Earless hedgehog. Without ears; head thick, short; claws long, crooked. Inhabits South America; about eight inches long.

3. E. malaccensis. Malacca hedgehog. Ears pendulous. Inhabits Asia: from it is procured the precious bezoard called piedra del porco.

4. E. auristus. Siberian hedgehog. Ears long, oval, nostrils with a flap. Inhabits the lower parts of the Volga and Ural, as far as lake Baikal; resembles e. Europœus, but is less; eyes larger, whiskers four rows, feet longer, slenderer, tail shorter, conic, annulate, nearly bald; female brings from four to seven young, sometimes twice a year; spines brown, a white ring at each end.

5. E. setosus. Asiatic hedgehog. Ears shorter; spines on the head, neck, tail and withers only. Inhabits India and Madagascar; hardly six inches long; wallows in the mire; grunts like a hog; burrows and is torpid six months, during which time the hair falls off.

6. E. excandata. Madagascar hedgehog. Tailless; snout very long, acute. Inhabits India and Madagascar; eight inches long; in its habits exactly resembles the last.

ERINGO, in botany. See Eryngium.

ERINUS, in botany, a genus of the class didynamia, angiospermia. Calyx five-leaved; corol with a five-cleft border, equal; the lobes emarginate; upper lip very short, and reflected; capsule two-celled. Seven species; chiefly natives of the Cape, with purple or yellow flowers; the stem from two inches to three feet in height.

ERIOCANLOR, in botany, a genus of the class triandria, order trigynia. General calyx an imbricate head; petals three, equal; stamens seated above the germ. Nine species; natives of India or South America.

ERIOCEPHALUS, in botany, a genus of the class syngenesia, order polygamia necessaria. Receptacle naked or villous; downless; calyx ten-leaved, equal; florets of the ray five. Three species; all Cape plants, and herbaceous.

ERIOPHORUM. Cotton-grass. In botany, a genus of the class triandria, order monogynia. Glumes chaffy, imbricate every way; corolless; seed one inverted with very long hairs. Six species; four of which are common to the bogs of our own country.

ERIOSPERMUM, in botany, a genus of the class hexandria, order monogynia. Corol six-petalled; campanulate, permanent; filaments dilated at the base, capsule three-celled; seeds inverted with wool. Three species; all Cape plants.

ERIOSTEMUM, in botany, a genus of the class decandria, order monogynia. Calyx five-parted; petals five, sessile; stamens flat, ciliate; anthers pedicelled, terminal; style from the base of the germ; capsules five united, seated on a nectary covered with protuberances; seeds coated. One species; an Australasian shrub with alternate leaves and solitary flowers.

ERIS, the goddess of discord among the Greeks. She is the same as the Discordia of the Latins.

ERI'STICAL. *a.* (ερις.) Controversial; relating to dispute; containing controversies.

ERITHALIS, in botany, a genus of the class pentandria, order monogynia. Corol five-parted, the segments recurved; calyx cup-shaped; berry ten-celled, inferior. Two species; trees of Jamaica or the Polynesian islands. The last has two varieties from a difference in the breadth of its leaf.

FRIVAN, a large town of Asia, capital of Persian Armenia, with an Armenian patriarch. Lat. 40. 20 N. Lon. 44. 10 E.

ERKE. *a.* (eaɲȝ, Sax.) Idle; lazy; slothful (*Chaucer*).

E'RMELINE. *s.* (diminutive of *ermine*; *armelin*, French.) An ermine (*Sidney*).

ERMINE, in mastiology. See Mustela.

Ermine, in heraldry, is always argent and sable, that is, a white field, or fur, with black spots. These spots are not of any determinate number, but may be more or less, at the pleasure of the painter, as the skins are thought not to be naturally so spotted; but serving for lining the garments of great persons, the furriers were wont, in order to add to their beauty, to sow bits of the black tails of the creatures that produced them upon the white of their skin, to render them the more conspicuous, which alteration was introduced into armoury.

Ermine, or Cross ermine, is one composed of four ermine spots. It is to be observed, that the colours in these arms are not to be expressed, because neither this cross nor these arms can be of any other colour than white and black.

ERMINED. *a.* Clothed with ermine, that is, with the skin or fur of ermine.

ERMINITES, in heraldry, should signify little ermines; but it is otherwise, for it expresses a white field powdered with black, only that every such spot has a little red hair on it.

E'RNE. E'RON. Do immediately flow from the Saxon eꞃn, eaꞃn, a cottage (*Gibson*).

ERNODEA, in botany, a genus of the class tetrandria, order monogynia. Corol one-petalled, salver-shaped; calyx four-parted; berry two-celled, seeds solitary. One species only, a creeping plant of Jamaica with axillary flowers.

To ERO'DE. *v. a.* (*erodo*, Lat.) To canker; to eat away; to corrode (*Bacon*).

ERODIUM. Crane's-bill, a genus of the class monadelphia, order pentandria. Calyx five-leaved; petals five; nectariferous glands five, alternating with the filaments; stamens ten, five of them barren; fruit beaked, separating into five capsules, each tipped with a long spiral awn bearded on the inside. Thirty-four species; chiefly inhabitants of the warmer parts of Europe, and three common to our own wastes or sea-coasts. They have all a general resemblance in their external appearance to the geranium, with which they have often been confounded by those who have not attended to their ordinal character. They may be thus sectioned:

A. Leaves compound, pinnate and pinnatified.

B. Leaves ternate, and three-parted.

C. Leaves lobed and undivided.

ERODIUS, in zoology, a genus of the class insecta, order coleoptera. Antennas moniliform; feelers four, filiform; body roundish, gibbous; emarginate; thorax transverse; shells closely united, longer than the abdomen; jaw horny, bifid; lip horny, emarginate. Four species; inhabit India or the Cape.

EROGATION. *s.* (*erogatio*, Latin.) The act of giving or bestowing; distribution.

EROSE LEAF, in botany, a gnawed leaf. When a sinuate leaf has other very small obtuse sinuses on its edge. Cum folium sinuatum margine sinus alios minimos obtusos acquirit. It has the appearance of being gnawed or eaten by insects.

ERO'SION. *s.* (*erosio*, Latin.) 1. The act of eating away. 2. The state of being eaten away (*Arbuthnot*).

EROTESIS, in rhetoric, interrogation.

EROTIA, a festival in honour of Eros the god of love. It was celebrated by the Thespians every fifth year with sports and games, when musicians and others contended. If any quarrels or seditions had arisen among the people, it was then usual to offer sacrifices and prayers to the god, that he would totally remove them.

EROTIC (derived from ερως, love, whence ερωτικος), is applied to any thing which has relation to the passion of love. In medicine we find the phrase delirium eroticum used for a kind of melancholy contracted through excess of love.

EROTOMANIA. (from ερως, love, and μανια, madness.) Desperate love: sentimentalism producing morbid feelings.

EROTYLUS, in zoology, a tribe of coleopterous insects belonging to the genus cryptocephalus, thus named in the Fabrician system.

ERPACH, a town of Franconia, in Germany, 30 miles S.E. of Frankfort. Lat. 49. 32 N. Lon. 9. 10 E.

ERPACH, a town and castle of Suabia, in Germany, 8 miles S.E. of Ulm. Lat. 48. 20 N. Lon. 10. 19 E.

ERPETOLOGY, a term formerly employed by the Swedish naturalist Klein; to include the order serpentes as well as that of reptilia; thus comprehending the whole class of amphibia. In the Encyclopedie Methodique, and the Encyclopædia Britannica, the term is restricted to the order of reptilia, according to the plan of M. Bonnaterre.

ERQUICO, a seaport town on the coast of Abex, in Africa. Lat. 17. 30 N. Lon. 39. 5 E.

To ERR. *v. n.* (*erro*, Latin.) 1. To wander; to ramble (*Dryden*). 2. To miss the right way; to stray (*Common Prayer*). 3. To deviate from any purpose (*Pope*). 4. To commit errours; to mistake (*Taylor*).

E'RRABLE. *a.* (from *err.*) Liable to err.

E'RRABLENESS. *s.* Liableness to errour; liableness to mistake (*Decay of Piety*).

E'RRAND. *s.* (æꞃenð, Sax.) A message; something to be told or done by a messenger; a mandate; a commission (*Hooker*).

E'RRANT. *a.* (*errans*, Latin.) 1. Wandering; roving; rambling (*Brown*). 2. Vile; abandoned; completely bad (*Jonson*).

E'RRANTRY. *s.* (from *errant.*) 1. An errant state; the condition of a wanderer (*Addison*). 2. The employment of a knight-errant.

ERRATA. *s.* (Latin.) The faults or mistakes of the printer, usually inserted in a list, at the beginning or end of a book.

ERRA'TIC. *a.* (*erraticus*, Latin.) 1. Wandering; uncertain; keeping no certain order; holding no established course (*Pope*). 2. Irregular; changeable (*Harvey*).

ERRA'TICALLY. *ad.* (from *erratical* or *erratic.*) Without rule; without method (*Brown*).

E'RRHINE. *a.* (ερρινα.) Snuffed up the nose, occasioning sneezing (*Bacon*).

ERRHINES. (*errhina, medicamenta*, ερρινα; from εν, in, and ριν, the nose.) Medicines which, when topically applied to the internal membrane of the nose, excite sneezing, and increase the secretion, independent of any mechanical irritation. The articles belonging to this class may be referred to two orders: 1. Sternutatory errhines, as nicotiana, helleborus, euphorbium, which are selected for the torpid, the vigorous, but not plethoric; and those to whom any degree of evacuation would not be hurtful. 2. Evacuating errhines, as asarum, &c. which is calculated for the phlegmatic and infirm.

ERRO'NEOUS. *a.* (from *erro*, Latin.) 1. Wandering; unsettled (*Newton*). 2. Irregular; wandering from the right road (*Arbuthnot*). 3. Mistaking; misled by errour (*South*). 4. Mistaken; not conformable to truth; physically false (*Newton*).

ERRO'NEOUSLY. *ad.* By mistake; not rightly (*Hooker*).

ERRO'NEOUSNESS. *s.* Physical falsehood; in conformity to truth (*Boyle*).

E'RROUR. *s.* (*error*, Latin.) 1. Mistake; involuntary deviation from truth (*Shakspeare*). 2. A blunder; a mistake committed (*Dryden*). 3. Roving excursion; irregular course (*Dryden*). 4. (In theology.) Sin (*Hebrews*). 5. (In law.) A mistake in pleading, or in the process (*Cowell*).

ERROUR, a mistake of the mind, in giving assent to a thing, or proposition, which is not true. See FALLACY.

Some philosophers define errour an act of the mind, whereby things that should be joined are separated; or, things that should be separated are joined; or a wrong judgement, disagreeing with the things whereon it is passed.

Errour stands in opposition to truth, which consists in an agreement between the proposition, and the thing whereof it is affirmed, or denied.

Mr. Locke reduces the causes of errour to these four; first, want of proofs; secondly, want of ability to use them; thirdly, want of will to use them; and, fourthly, wrong measures of probability.

He observes upon the first of these causes that the greatest part of mankind want conveniencies and opportunities of making experiments and observations themselves, or of collecting the testimony of others, being prevented by the necessity of their condition. Upon the second of these causes he observes, that there are many, who, from the state of their condition, might bestow time in collecting proofs, but yet are not able to carry a train of consequences in their heads, nor weigh exactly the preponderancy of contrary proofs and testimonies, merely from the difference in men's understandings, apprehensions, and reasonings. Thirdly, he remarks, that though some have opportunities and leisure enough, and want neither parts, learning, nor other helps, that they never come to the knowledge of several truths within their reach, either upon account of their attachment to pleasure or business; or otherwise because of their laziness or aversion to study. The fourth cause of errour, viz. wrong measures of probability, he imputes, 1. To the practice of taking for principles, propositions that are not in themselves certain and evident, but, on the contrary, doubtful and false. 2. To received hypotheses. 3. To predominant passions or inclinations. And, 4. To authority, or the giving up our assent to the common received opinions either of our friends or party, neighbours or country.

The causes of errour in philosophy, or the reasons why all former philosophers have through so many ages erred, according to lord Bacon, are these following. 1. Want of time suited to learning. 2. The little labour bestowed upon natural philosophy. 3. Few entirely addicted to natural philosophy. 4. The end of the sciences wrong fixed. 5. A wrong way chosen. 6. The neglect of experiments. 7. Regard to antiquity and authority. 8. Admiration of the works in use. 9. The artifice of teachers and writers in the sciences. 10. Ostentatious promises of the moderns. 11. Want of proposing worthy tasks. 12. Superstition and zeal being opposite to natural philosophy, as thinking philosophy dangerous, on account of the school-theology; from the opinion that deep natural inquiries might subvert religion. 13. Schools and academies proving unfavourable to philosophy. 14. Want of rewards. And 15. Despair, and the supposition of impossibility.

ERROR LOCI. Boerhaave is said to have introduced this term, from an opinion that the vessels are of different sizes, for the circulation of red blood, lymph, and serum; and that when the larger sized globules were forced into the lesser vessels by an error of place they were obstructed.

ERST. *ad.* (*erst*, German.) 1. First (*Spenser*). 2. At first; in the beginning (*Milton*). 3. Once; when time was (*Milton*). 4. Formerly; long ago (*Prior*). 5. Before; till then; till now (*Knolles*).

ERUBE'SCENCE. ERUBE'SCENCY. *s.* (*erubescentia*, Latin.) The act of growing red; redness.

ERUBE'SCENT. *a.* (*erubescens*, Latin.) Reddish; somewhat red; inclining to redness.

ERUCA. (*eruca*; from *erugo*, to make smooth, so named from the smoothness of its leaves; or from *uro*, to burn, because of its biting quality.) Garden rocket. Roman rocket. Rocket gentle. The seeds of this plant, brassica eruca; foliis lyartis, caule hirsuto siliquis glabris, of Linnéus, and of the wild rocket, have an acrid taste, and are eaten by the Italians in their pickles, &c. They are said to be good aperients and antiscorbutics, but are esteemed by the above-mentioned people for their supposed aphrodisiac qualities. See BRASSICA.

ERUCA is also a term formerly used by naturalists to denote the caterpillar state of insects; but of late discarded for that of caterpillar, larve or larva. For the process by which this change is produced, see the articles ENTOMOLOGY, and PAPILIO.

To ERU'CT. *v. a.* (*eructo*, Latin.) To belch; to break wind from the stomach.

ERUCTA'TION. *s.* (from *eruct.*) 1. The act of belching. 2. Belch; the matter vented from the stomach (*Arbuthnot*). 3. A sudden burst of wind or matter (*Woodward*).

ERUDITION (from the Latin), denotes learning or knowledge; and chiefly that of history and antiquity, of languages and of books, which is the result of hard study and extensive reading. The Scaligers were men of deep erudition; the writings of M. Launoy, a priest of the oratory, are full of erudition. Mr. Locke says, it is of more use to fill the head with reflections than with points of erudition. If the mind be not just and right, ignorance is better than erudition, which only produces confusion and obscurity. M. Balzac calls a heap of ill chosen erudition the luggage of antiquity.

ERU'GINOUS. *a.* (*æruginosus*, Latin.) Partaking of the nature of copper (*Harvey*).

ERU'PTION. *s.* (*eruptio*, Latin.) 1. The act of bursting forth (*Bacon*). 2. Burst; emission (*Addison*). 3. Sudden excursion of a hostile kind (*Milton*). 4. Violent exclamation (*South*). 5. Efflorescence; pustules (*Arbuthnot*).

ERU'PTIVE. *a.* (*eruptus*, Latin.) Bursting forth (*Thomson*).

ERVUM. Tare. In botany, a genus of the class diadelphia, order decandria. Calyx four-cleft; stigma capitate; hairy all over. Three species, as follow:

1. E. tetraspermum: with two-flowered peduncles; glabrous, four-seeded, legumes; and oblong leaflets. Found in the corn-fields of our own country.

2. E. hirsutum: with many-flowered peduncles; hairy, two-seeded legumes; leaflets linear, truncate with a point; common also to our corn-fields.

3. E. vicioides. Peduncles about four-flowered; legumes silky, two-seeded; leaflets ovate. A native of Barbary.

For a further account of indigenous tares, see HUSBANDRY.

ERY'NGIUM. (*eryngium*, ερυγγιον; from ερυγγανω, to eructate, because it causes eructation.) Eryngo, a genus of the class pentandria, order digynia. Involucre many-leaved; flowers in heads; common receptacle conic, chaffy; seeds bristly. Eleven species; chiefly natives of the south of Europe. Of these the chief are:

1. E. aquaticum. Rattle-snake weed, with leaves sword-shaped, serrate-spinous; flowers undivided; stem simple. This is a native of Virginia.

2. E. campestre. Leaves clasping the stem, divided into lanceolate fragments; chaff undivided. Found in our own salt-marshes.

3. E. maritimum. Sea-eryngo, or sea-holly: root-leaves roundish, plaited, spinous; heads peduncled; chaff tricuspidate. It is found on the sandy shores of our own country. The root of this plant is directed for medicinal use. It has no particular smell, but to the taste it manifests a grateful sweetness; and, on being chewed for some time, discovers a light aromatic warmth or pungency. It was formerly celebrated for its supposed aphrodisiac powers, but it is now very rarely employed.

4. E. alpinum: alpine eryngo, with radical, petiolated, cordate leaves; and pinnated, ciliate involucre. It is a hardy perennial, well worthy of a place in every curious garden, where its uncommon form and beautiful colour cannot fail to attract the notice of every beholder. Its beauty and peculiarity are dependent on its floral leaves rather perhaps than on its blossom, admired for their feathery appearance and delicate blue tint. See Botany, Pl. XCIV.

ERYNGO. See ERYNGIUM.

ERYSIMUM. (*erysimum*, ερυσιμον; from ερυω, to draw, so called from its power of drawing and producing blisters; others derive it απο τυ ερυκειν, because the leaves are much cut; others from εριτιμον, precious.) Hedge mustard. A genus of the class tetradynamia, order siliquosa. Silique columnar, exactly square; calyx closed; stigma capitate. Fourteen species: all European plants, and many of them indigenous to our own country. Of these the chief are:

1. E. alliaria. Jack in the hedge. Leaves heart-shaped, acute toothed. Found in our hedges.

2 E. Barbarea. The barberea of the dispensatories. Lower leaves lyrate, with the terminal lobe rounded; upper ones obovate, toothed.

3. E. officinalis. Medicinal eryngo. Siliques pressed close to the spike-stalk: leaves runcinate. In medical practice formerly much used for its expectorant and diuretic qualities, which are now forgotten. The seeds are warm and pungent, and very similar to those of mustard in their effects.

ERYSI'PELAS. (*erysipelas*, ερυσιπελας; from ερυω, to draw, and πελας, adjoining; named from the neighbouring parts being affected by the eruption.) Ignis sacer. St. Anthony's fire. A genus of disease in the class pyrexiæ and order exanthemata of Cullen. It is known by synocha of two or three days continuance, with drowsiness, and sometimes with delirium; pulse commonly full and hard; then erythema of the face, with continuance of synocha, tending to either apoplexy or to abscess. There are two species of this disease, according to Cullen: 1. Erysipelas vessiculosum, with large blisters: 2. Erysipelas phlyctænodes, the shingles, or an erysipelas with phlyctenæ, or small blisters.

ERYTHEMA. (*erythema*, ερυθημα; from ερυθρος, red.) A morbid redness of the skin, as is observed upon the cheeks of hectic patients after eating, and on the skin covering bubo, phlegmon, &c.

ERYTHRÆA, a town of Crete, situated in the south-east of the islands at the promontory Erythræum.

ERYTHRÆUM MARE, erroneously called Rubrum by the Romans. Thus the ocean that washes Arabia and Persia, and extends a great way farther, is denominated. Hence it is, Herodotus says, that the Euphrates and Tigris fall into the Mare Erythræum. He also calls it the South sea, on which the Persians dwell. It takes its name, not from its colour, the error of the Romans, who translated Erythræum, Rubrum; but from Erythras, son of Perseus and Andromeda, whose kingdom lay on the confines of that sea; whence its name Erythræum.

ERYTHRINA. Corol-tree. In botany, a genus of the class diadelphia, order decandria. Calyx two-lipped; corol with a very long, lanceolate banner; legume swelling at the seeds. Twelve species; natives of India or South America, under-shrubs and tall trees; generally with saffron or scarlet flowers.

ERYTHRINUS, in ichthyology. See SPARUS.

ERYTHROIDES, in anatomy, the first of the proper tunics or coats which cover the testicles.

ERYTHRONIUM. Dogs-tooth violet. In botany, a genus of the class hexandria, order monogynia. Corol six-petalled, campanulate; nectaries two tubercles growing to the base of every other petal. One species only; a native of the south of Europe There are, however, many varieties of this species; some with pale red, others with deep red, and others again with yellow, crimson, or white flowers. It is often propagated in our greenhouses, and is naturalised without difficulty.

ERYTHROXYLON, in botany, a genus of the class decandria, order trigynia. Calyx turbinate; petals five, with a small nectariferous emarginate scale at the base of each; stamens united at the base; drupe one-celled. Twelve species; natives of Africa or South America: shrubs chiefly.

ERYTRODANUM. (*erythrodanum*, ερυθροδανον; from ερυθρος, red, so called from the colour of its juice.) See RUBIA, or MADDER.

ERYX, a son of Butes and Venus, who, relying upon his strength, challenged all strangers to fight with him in the combat of the cestus. Hercules accepted his challenge after many had yielded to his superior dexterity; and Eryx was killed in the combat, and buried on the mountain, where he had built a temple to Venus. Virg. Æn. 5. ver. 402. A mountain of Sicily near Drepanum, also received its name from Eryx, who was buried there.

ERZERUM, the capital of Turcomania, in Asiatic Turkey. It is the see of an Armenian and of a Greek bishop, and the seat of a beglerberg. It is a great thoroughfare, and a resting place for the caravans in their way to the East Indies. The inhabitants trade in furs, gall nuts, Persian silks, cottons, calicoes, and drugs. Lat. 39. 57 N. Lon. 40. 41 E.

ESCALA'DE. *s.* (French.) The act of scaling the walls of a fortification (*Addison*).

ESCALLO'NIA, in botany, a genus of the class pentandria, order monogynia. Petals five; stigma capitate; berry covered with the calyx, two-celled, many-seeded. Two species; natives of South America.

E'SCALOP. *s.* 1. A shellfish, whose shell is regularly indented (*Woodward*). 2. An inequality of margin; indenture (*Ray*).

To ESCA'PE. *v. a.* (*escaper*, French.) 1. To obtain exemption from; to obtain security from; to fly; to avoid (*Wake*). 2. To pass unobserved by one (*Denham*).

To ESCA'PE. *v. n.* To fly; to get out of danger; to avoid punishment (*Chronicles*).

ESCA'PE. *s.* (from the verb.) 1. Flight; the act of shunning danger (*Psalms*). 2. Excursion; sally (*Denham*). 3. (In law.) Violent or privy evasion out of some lawful restraint (*Cowell*). 4. Excuse; subterfuge; evasion (*Raleigh*). 5. Sally; flight; irregularity (*Milton*). 6. Oversight; mistake (*Brerewood*).

ESCA'RGATOIRE. *s.* (French.) A nursery of snails (*Addison*).

ESCHALOT. *s.* (French.) Pronounced *shallot*. A plant. See ALLIUM.

ESCHAR. (*eschara*, εσχαρα; from εσχαραω, to scrub over.) The portion of flesh that is destroyed by the application of a caustic.

ECHA'ROTIC. *a.* (from *eschar.*) Caustic; having the power to sear or burn the flesh.

ESCHAROTICS. (*escharotica*, *medicamenta*, εσχαρωτικα; from εσχαραω, to scab over.) Caustics. Corrosives. A term given by surgeons to those substances which possess a power of destroying the texture of the various solid parts of the animal body to which they are directly applied. The articles of this class of substances may be arranged under two orders: 1. Eroding escharotics, as blue vitriol, alumen ustum, &c. 2. Caustic escharotics, as lapis infernalis, argentum nitratum, oleum vitrioli, acidum nitrosum, &c.

ESCHATON, a Greek musical term, denoting the difference between the diesis enharmonica and the hyperoche: its ratio is $\frac{393216}{390625}$.

ESCHEAT, in law, signifies any lands or tenements that casually fall to a lord within his manor. It is one of the consequences of tenure in chivalry: (See FEODAL SYSTEM, KNIGHT-SERVICE, and TENURE). It is the determination of the tenure or dissolution of the mutual bond between the lord and tenant, from the extinction of the blood of the latter by either natural or civil means: if he died without heirs of his blood, or if his blood was corrupted and stained by commission of treason or felony; whereby every inheritable quality was entirely blotted out and abolished. In such cases the land escheated or fell back to the lord of the fee; that is, the tenure was determined by breach of the original condition, expressed or implied in the feodal donation.

To ESCHE'AT. *v. a.* (from the noun.) To fall to the lord of the manor (*Clarendon*).

ESCHE'ATOR. *s.* (from *escheat.*) An officer that observes the escheats of the king in the county whereof he is escheator (*Camden*).

ESCHEVIN, or ECHEVIN (*Scabinus*), in the French and Dutch polity, a magistrate elected by the inhabitants of a city, to take care of their common concerns, the good order, conveniency, and decoration of the city, &c.

To ESCHE'W. *v. a.* (*escheoir*, old French.) To fly; to avoid; to shun (*Sandys*).

ESCO'RT. *s.* (*escort*, French.) Convoy; guard from place to place.

To ESCO'RT. *v. a.* (*escorter*, French.) To convoy; to guard from place to place.

ESCO'T. *s.* (French.) A tax paid in boroughs and corporations towards the support of the community, which is called *scot* and *lot*.

To Esco't. *v. a.* (from the noun.) To pay a man's reckoning; to support (*Shakspeare*).

ESCO'UT. *s.* (*escouter*, Fr.) Listeners or spies; persons sent for intelligence (*Hayward*).

ESCRITOI'R. *s.* (Fr.) A box with all the implements necessary for writing.

ESCU'AGE. *s.* (from *escu*, Fr. a shield.) *Escuage*, that is, service of the shield, is either uncertain or certain. *Escuage* uncertain is, where the tenant by his tenure is bound to follow his lord. Another kind of this *escuage* uncertain is called castleward, where the tenant by his land is bound to defend a castle. *Escuage* certain is, where the tenant is set at a certain sum of money, to be paid in lieu of such uncertain services (*Cowell*).

E'SCULENT. *a.* (*esculentus*, Latin.) Good for food; eatable (*Bacon*).

E'sculent. *s.* Something fit for food (*Brown*).

ESCURIAL, a village and palace of the king of Spain, twenty-one miles north-west of Madrid. The palace is one of the largest and most beautiful in the world. It has eleven thousand windows, fourteen thousand doors, one thousand eight hundred pillars, seventeen cloisters or piazzas, and twenty-two courts; with every convenience and ornament that can render a place agreeable in so hot a climate, as an extensive park, groves, fountains, cascades, grottos, &c. It is whimsically constructed in the form of a gridiron, being dedicated to St. Lawrence in commemoration of a victory, gained on the anniversary of that saint (who is said to have been broiled to death on a gridiron) in 1557. The apartment which the royal family inhabits is the handle of the instrument. The rest of the building contains offices, a church, a convent (in which are 200 monks), and a library containing 30,000 volumes.

ESCUTCHEON, or Scutcheon, in heraldry, is derived from the French *escusson*, and that from the Latin *scutum*, and signifies the shield whereon coats of arms are represented. Most nations of the remotest antiquity were wont to have their shields distinguished by certain marks painted on them; and to have such on their shields was a token of honour, none being permitted to have them till they had performed some honourable action.

The escutcheon, as used at present, is square, only rounded off at the bottom.

As to the bearings on shields, they might at first be arbitrary, according to the fancy of the bearer; but in process of time they came to be the gift of kings and generals, as the reward of honourable actions.

Escutcheon of pretence, that on which a man carries his wife's coat of arms, being an heiress, and having issue by her. It is placed over the coat of the husband, who thereby shows forth his pretensions to her lands.

ESDRAS, a Jewish priest, and doctor of the law. Artaxerxes Longimanus sent him with rich presents for the use and ornament of the temple of Jerusalem, rebuilt under Zerubbabel: the king also ordered the neighbouring governors to provide him with what conduced to the pomp of the Jewish religion, and to exempt the priests from paying taxes. He is supposed to be the collector of the Canon of Scripture; and that, by divine inspiration, he added some things which happened after the deaths of the authors. It is guessed he wrote the Chronicles, besides those books which bear his name, the two last of which are exploded even by the church of Rome.

ESENS, a town of Westphalia, in Germany, 20 miles N. of Embden. Lat. 53. 14 N. Lon. 7. 14 E.

ESK, the name of several rivers both in England and Scotland, particularly of one which forms part of the boundary between the two kingdoms. It runs from north-east to south-west, and gives name to the county of Eskdale

ESKIMAUX, a people of N. America, inhabiting all that vast tract of country called Labrador, or New Britain. They have no fixed abode, but rove from place to place; for they sometimes come as far S. as Newfoundland, and sometimes are met with on the coasts of the straits and bays that the English have been in when they went in search of the N.W. passage. They are of a different race from the other native Americans; for, as they have no beards, these have them so thick and large, that it is difficult to discover any features of their faces. They have small eyes, large dirty teeth, and black rugged hair. They are always well clothed, for there is nothing to be seen but part of their faces and their hands. They have a sort of shirts, made of the guts of fish, with a coat of bear or bird skins, and a cap on their heads. They have likewise breeches, made of skins, with the hair within, and covered with furs without. They have also two pair of boots, one over another, of the same sort of skins. In summer they have nothing to cover them in the night; but, in winter, they lodge together promiscuously in caves. The dress of the women is nearly the same as that of the men. They are very superstitious, and have some sort of sacrifices. Their chief employment is hunting and fishing.

ESNE, Asne, or Essenay, a town of Egypt, on the Nile, supposed by some to be the ancient Syena, but Norden and Denon think it was Latopolis. Here are many curious remains of antiquity. Lat. 24. 46 N. Lon. 31. 40 E.

ESOX. Pike. In zoology, a genus of the class pisces, order abdominales. Head flattish above; mouth and throat large; jaws toothed, unequal, the upper flat, the lower punctate; tongue broad, loose; palate smooth; eyes round, moderate, lateral; nostrils double, near the eyes; gill-covers large; the aperture ample; the membrane from seven to twelve-rayed; body elongated, coated with hard scales, above convex, and compressed at the sides; lateral line straight, near the back, hardly visible; dorsal and anal fins very short, and mostly opposite. Fifteen species; found in various seas and rivers of Europe, Asia, and America: four of them in our own seas or rivers. The following are the chief. See Nat. Hist. Pl. LXXXVI. and Pl. XCVI.

1. E. osseus. Great gar-fish. Upper jaw longer than the lower; scales bony; tail quadrangular; iris yellow. Inhabits North America and Asia, and is occasionally found on the Sussex coast; scales imbricate; rhombic, those on the back rounded and retuse. Two feet long.

2. E. belone. Sea-pike. Gar-pike. Each jaw long, subulate; head small, eyes large, round, iris silvery. The bones have a shining green splendour by night. Inhabits the deeps of the ocean, and migrates annually towards the coasts, always preceding the mackerel; is seldom eaten. From one and a half to four feet long; body narrow, long, slender, above black, the sides greenish blue, coated with oblong thin scales, beneath silvery.

3. E. lucius. Common pike. Snout depressed; jaws nearly equal. A second variety with the upper jaw a little shorter than the lower: head broad, flat, pupil bluish, iris golden. Inhabits most lakes of Europe, Lapland, and northern Persia; (the second variety North America) and is found even in the Caspian sea: swims swift; grows very rapidly; from one to eight feet long; is extremely voracious, and feeds on almost any thing that comes in its way, even on its own tribe. It spawns from February to April: body above black; the sides cinereous, spotted with yellow, beneath white, dotted with black, rarely orange, spotted with black or green; scales small, oblong, hard.

The pike, like the carp, is possessed of great longevity; various instances have occurred of its being ninety years old; and Gesner relates an anecdote of a pike taken in 1497, near Hailburn in Suabia, with a ring affixed to its body, on which was an inscription asserting it to have been put into the lake by the governor of the universe Frederic II. October 5th, 1230. The inscription was in Greek characters.

The voracity of the pike induces it at times to attempt to swallow more than it can accomplish. In lord Gower's canal at Trentham, a pike once tried to swallow a swan, and actually got the head into its gorge; but could get no more down, and died in the effort, as did also the swan itself. The largest which has ever been found in our own country, according to Mr. Pennant, weighed thirty-five pounds.

4. E. saurus. Saury pike. Above and beneath six spurious fins near the tail. Inhabits the Northern seas, and sometimes descends to our own coasts; eleven inches long: body eel-shaped, growing suddenly slender near the tail; back dusky; belly bright-silvery; tail deeply forked.

ESPALIERS, in gardening, rows of trees planted about a whole garden or plantation, or in hedges, so as to inclose quarters or separate parts of a garden. They are trained up regularly to a lattice of wood-work in a close hedge, for the defence of tender plants against the injuries of wind and weather. See GARDENING.

ESPECIAL. *a.* (*specialis*, Latin.) Principal; chief (*Daniel*).

ESPE'CIALLY. *ad.* Principally; chiefly; particularly (*Hooker*).

ESPE'RANCE. *s.* (French.) Hope (*Shakspeare*).

ESPERNON, a town of France, in the department of Eure and Loire, seated on the Guesle. Lat. 48. 36 N. Lon. 1. 44 E.

ESPI'AL. (French.) A spy (*Spenser*).

ESPIONA'GE. (French.) The system of spying and informing.

ESPLANADE, in fortification, the sloping of the parapet of the covered way towards the campaign. It is the same with glacis, and is more properly the empty space betwixt a citadel and the houses of a town, commonly called a place of arms. See FORTIFICATION.

ESPLEES, in law, the general products which lands yield, or the profit or commodity that is to be taken or made of a thing; as of a common, the taking of grass by the mouths of the beasts that common there; of an advowson, taking of tythes by the parson; of wood, the selling of wood; of an orchard, selling the fruit growing there; of a mill, the taking of toll, &c.

These and such like issues are termed esplees. In a writ of right of land, advowson, &c. the demandant must allege in his count, that he or his ancestors took the esplees of the thing demanded, otherwise the pleading is not good.

ESPO'USAL. *a.* Used in the act of espousing or betrothing (*Bacon*).

ESPO'USALS. *s.* without a singular. (*espous*, French.) The act of contracting or affiancing a man and woman to each other.

To ESPO'USE. *v. a.* (*espouser*, French.) 1. To contract or betroth to another (*Bacon*). 2. To marry; to wed (*Milton*). 3. To adopt; to take to himself (*Bacon*). 4. To maintain; to defend (*Dryden*).

To ESPY'. *v. a.* (*espier*, French.) 1. To see things at a distance (*Hooker*). 2. To discover a thing intended to be hid (*Sidney*). 3. To see unexpectedly (*Genesis*). 4. To discover as a spy (*Joshua*).

To ESPY'. *v. n.* To watch; to look about (*Jeremiah*).

ESQUILIÆ, one of the hills of Rome, called by some of the ancients Suburranus, by the poets Esquilius. On the E. side it reached the city walls; on the S. the Via Lavicana; on the W. the valley between Mount Coelius and the Palatinate; on the N. the Mons Viminalis.

ESQUIMAUX. See ESKIMAUX.

ESQUIRE, (from the French *escu* and the Latin *scutum*, or in Greek *σκυτος*, which signifies a hide, of which shields were anciently made, and afterwards covered; for, in the time of the Anglo-Saxons, the shields had a covering of leather), was originally he, who, attending a knight in time of war, did carry his shield; whence he was called *escuier* in French, and *scutifer* or *armiger*, i. e. armour-bearer, in Latin. Hotoman says, that those whom the French called esquires, were a military kind of vassals, having *jus scuti*, viz. liberty to bear a shield, and in it the ensigns of their family, in token of their gentility or dignity. But this addition hath not of long time had any relation to the office or employment of the person to whom it hath been attributed, as to carrying of arms, &c. but hath been merely a title of dignity, and next in degree to a knight. Officers of the king's courts, and of the king's household, counsellors at law, justices of the peace, are only esquires in reputation; and he who is a justice of peace has this title only during the time he is in commission, and no longer, if he is not otherwise qualified to bear it. A sheriff of a county being a superior officer, bears the title of esquire during his life; in respect of the great trust he has in the commonwealth. The chief of some ancient families are esquires by prescription; and in some acts of parliament, many wealthy persons commonly reputed to be such, were ranked among the esquires of this kingdom. The fellows of the Royal Society assume this title officially in the Philosophical Transactions: probably in consequence of the king being their patron. There is a general opinion, that every gentleman of landed property who has 300*l.* a year, is an esquire; which is a vulgar error. By custom, however, and by way of compliment, this title is indiscriminately given to every gentleman who lives on his private fortune, to rich merchants also, and even opulent tradesmen or manufacturers.

Esquires of the king, are such as have that title by creation, wherein there is some formality used, as their putting about their necks a collar of SS, and bestowing on them a pair of silver spurs, &c.

To **ESSA'Y.** *v. a.* (*essayer*, French.) 1. To attempt; to try; to endeavour (*Pope*). 2. To make experiment of. 3. To try the value and purity of metals (*Locke*).

E'ssay. *s.* (from the verb.) 1. Attempt; endeavour (*Smith*). 2. A loose sally of the mind; an irregular indigested piece (*Bacon*). 3. A trial; an experiment (*Locke*). 4. First taste of any thing (*Dryden*).

Essay, in literature, a particular kind of composition, the character of which is to be free, easy, and natural; not tied to strict order or method, nor worked up and finished like a formal system. The father of English essay writing was lord chancellor Bacon.

ESSAYING, in chemistry. See Assaying.

ESSECK, a trading town of Sclavonia, with a strong castle. It has a bridge over the marshes, 8865 geometrical paces in length, and 15 in breadth, with towers at a quarter of a mile distance from each other. This town is seated on the river Drave. Lat. 45. 40 N. Lon. 19. 58 E.

ESSENCE. *s.* (*essentia*, Latin.) 1. Essence is the very nature of any being, whether it be actually existing or no (*Watts*). 2. Formal existence; that which makes any thing what it is (*Hooker*). 3. Existence; the quality of being (*Sidney*). 4. Being; existent person (*Milton*). 5. Species of existent being (*Bac.*). 6. Constituent substance (*Milt.*). 7. The cause of existence: not proper (*Shakspeare*). 8. (In medicine.) The chief properties or virtues of any simple, or composition collected in a narrow compass. 9. Perfume; odour; scent (*Pope*).

Essence, in metaphysics, that which constitutes the peculiar nature of any thing, and makes it to be what it is. In philosophy, the essence of a thing is that which is the primary conception which one has of it, and is distinguished from its act, which is called its existence. Thus the essence of a rectilinear triangle, consists in its being bounded by three straight lines; of a circle, in that its radii or semi-diameters are all equal; and the essence of a square is, that it hath four right angles and four equal right-lined sides.

Essences, or Essential oils, in pharmacy and chemistry; the volatile parts impregnated with specific aromas, which ascend from odoriferous substances by means of heat. The process by which these are obtained is usually that of distillation; and generally distillation in water. On account of the facility with which they ascend, they are also denominated volatile oils; and as plants are the substances from which they are obtained, they are again called vegetable oils. Their general nature and properties, together with the process by which they are separated from the vegetable matter that secretes and involves them, will be given under the article Oil, to which we refer the reader; as also to Pharmacy.

To E'ssence. *v. a.* (from *essence*.) To perfume; to scent.

ESSENES, or Essenians, in Jewish antiquity, one of the three ancient sects among that people. They allowed a future state, but denied a resurrection from the dead. Their way of life was very singular: they did not marry; but adopted the children of others, whom they bred up in the institutions of their sect: they despised riches, and had all things in common, and never changed their clothes till they were entirely worn out. When initiated, they were strictly bound not to communicate the mysteries of their sect to others; and if any of their members were found guilty of enormous crimes, they were expelled. Pliny tells us, that they dwelt on the west side of the lake of Asphaltites; and that they were a solitary kind of men, living without women or money, and feeding upon the fruit of the palm-tree: he adds, that they were constantly recruited by new comers, whom the surges of ill fortune had made weary of the world; in which manner the sect was kept up for several thousands of years, without any being born among them. The reason why we find no mention made of them in the New Testament may be, their recluse and retired way of life, not less than their great simplicity and honesty, whereby they lay open to no censure or reproof.

ESSE'NTIAL. *a.* (*essentialis*, Latin.) 1. Necessary to the constitution or existence of any thing (*Sprat*). 2. Important in the highest degree; principal (*Denham*). 3. Pure; highly rectified; subtilely elaborated (*Arbuthnot*).

Essential character. In natural history. *Character essentialis.* A single or peculiar natural mark, distinguishing one *genus from all others in the same natural order.*

ESSENTIAL OILS. See OIL.

ESSENTIAL SALT. This term seems to be generally applied to express any kind of salt procured from organised bodies, particularly vegetables, by simple extraction without any chemical decomposition. It is, therefore, synonymous with native salt. Thus we have the essential salt of sorrel, which is the native super-oxalat of potash contained in the plant, and procured by expression, clarification, and evaporation, all of them mechanical rather than simple processes. The super-tartrit of potash is an essential salt in tamarinds, the citric acid in lemons, the malic acid in apples, and the like.

The medicinal virtue of plants was thought formerly to reside peculiarly in the essential salt, so that a small dose of the latter would be equivalent to a proportionally large dose of the plant itself; and hence the extraction of the essential salts was an object of more importance to pharmaceutical chemistry than it is at present esteemed.

ESSE'NTIAL. *s.* 1. Existence; being (*Milton*). 2. Nature; first or constituent principle (*South*). 3. The chief point.

ESSE'NTIALLY. *ad.* (*essentialiter*, Lat.) By the constitution of nature; really (*South*).

ESSERA. (*essera*, Arab.) A species of cutaneous eruption, distinguished by broad, shining, smooth, red spots, mostly without fever, and differing from the nettle rash in not being elevated. It generally attacks the face and hands.

ESSEX, a county of England, bounded on the N. by part of Cambridgeshire, and by the river Stour, which separates it from Suffolk; on the E by the German Ocean; on the S. by the Thames, which divides it from Kent; and on the W. by Herts and Middlesex, being divided from the former, in one part by the Stort, and then by the Lea, which separates it likewise from Middlesex. It is 54 miles long from E. to W. and 48 broad from N. to S. It is in the diocese of London; contains 18 hundreds, 24 market-towns, and 415 parishes; and sends eight members to parliament. The number of houses is 39,398; of inhabitants 226,407; and of militia men 1244. There are about 800,000 acres of land, 30,000 of which are uncultivated, including woodlands. The N.W. part of this county is famous for the growth of saffron. The parts bordering on the Thames and the sea, called the Hundreds of Essex, consist chiefly of marshy grounds, which afford excellent pasturage, but are deemed unwholesome and agueish to a proverb. The rivers of Essex, besides the boundary ones, are the Chilmer, Blackwater, Coln, Crouch, and Roding. Chelmsford is the county town.

ESSOI'NE. *s.* (of the French *essonié*.) 1. He that has his presence forborn or excused upon any just cause; as sickness. 2. Allegement of an excuse for him that is summoned, or sought for, to appear (*Cowell*). 3. Excuse; exemption (*Spenser*).

ESSOIN, *in law, an excuse for a person summoned to appear and answer to an action, on account of sickness or other just cause of his absence.*

It is a kind of imparlance or craving of longer time, and obtains in real, personal, and mixed actions.

There are divers essoins: as de ultra mare, when the defendant is beyond sea, whereby he is allowed forty days; in an expedition to the Holy Land, a year and a day; infirmity, called common essoin when he is sick in bed; and lastly, in the king's service.

ESSOIN-DAY, is regularly the first day of every term, though the fourth day after is also allowed by way of indulgence.

ESSOIN DE MALO VILLÆ, is where the defendant appears in court, but before pleading, falls sick in a certain village: this is also allowed, if found true.

To **ESTA'BLISH.** *v. a.* (*etablir*, French.) 1. To settle firmly; to fix unalterably (*Hale*). 2. To settle in any privilege or possession; to confirm (*Swift*). 3. To make firm; to ratify (*Numbers*). 4. To fix or settle in an opinion (*Acts*). 5. To form or model (*Clarendon*). 6. To found; to build firmly; to fix immoveably: not in use (*Psalms*). 7. To make a settlement of any inheritance: not in use (*Shak.*).

ESTA'BLISHER. *s.* (from *establish*.) He who establishes (*Digby*).

ESTA'BLISHMENT. *s.* (*etablissement*, French.) 1. Settlement; fixed state (*Spenser*). 2. Confirmation of something already done; ratification (*Bacon*). 3. Settled regulation; form; model of a government or family (*Spenser*). 4. Foundation; fundamental principle (*Att.*). 5. Allowance; income; salary (*Sw.*).

ESTABLISHMENT, among ecclesiastical writers, is used to signify the hierarchy, or church established in a nation by law. Thus, the religion of the English establishment is the episcopal; that of the Scotch establishment is the presbyterian. Episcopalians being dissenters there, and presbyterians dissenters here.

ESTATE, in law, signifies such inheritance, freehold, term for years, tenantcy by statute-merchant, staple, elegit, or the like, as any man has in lands and tenements. Estates are real, of lands, tenements, &c. or personal, of goods or chattels; otherwise distinguished into freeholds that descend to the heir, and chattels which go to the executors. Co. Lit. 315.

Of estate in fee-simple. An estate in fee-simple, is an estate, lands, tenements, lordships, advowsons, commons, estovers, and all hereditaments, to a man and his heirs for ever: also, where a corporation sole or aggregate are capable of holding in succession, and lands are given to them and their successors, they are said to have a fee-simple. 2. Bac. Abr. 249.

Of estate in tail. An estate is said to be intailed, when it is ascertained what issue shall inherit it.

What things may be intailed, by the statute of intails. The statute makes use of the word tenementum, and therefore the estate to be intailed may be as well incorporeal as corporeal inheritances, because the word tenementum comprehends the one as well as the other, and consequently, not only lands may be intailed, but all rents, commons, estovers, or other profits arising from lands. Co. Lit. 19, b. 20, a.

What words create an estate tail. When the notion of succession prevailed, it was necessary in feudal donations to use the word heirs, to distinguish such descendible feud from that which was granted only for life; but as to the word body, it was necessary to make use of that in the donation, but it might be expressed by any equivalent words, and therefore a gift to a man and hærdibus de se, or de carne quo sibi contigerit habere, or procreavit, is a good estate tail; for these sufficiently circumscribe the word heirs, to the descendants of the feudatory; and the reason of the difference is, because inheritances are only derived from the law, and the law requires the word heirs, that comprehends the whole notion of such legal representation; but the limiting the inheritance to the descendants of this or the other body, is only the particular intention of the person that forms the gift, and therefore the law leaves every man to express himself in such manner as may manifest that intention. 2. Bac. Abr. 259.

ESTAVAYER, a town and bailiwic of Swisserland, in the canton of Friburg, on the borders of the lake of Neuchatel, with a fine castle. Lat. 46. 55 N. Lon. 6. 50 E.

To ESTE'EM. *v. a.* (*estimer*, French.) 1. To set a value whether high or low upon any thing (*Wisdom*). 2. To compare; to estimate by proportion (*Davies*). 3. To prize; to rate high; to regard with reverence (*Dryden*). 4. To hold in opinion; to think (*Romans*).

Este'em. *s.* (from the verb.) High value; reverential regard (*Pope*).

Esteem is the value we place upon some degree of worth. It is higher than simple approbation, which is a decision of the judgment. Esteem is the commencement of affection. It is a degree of love entertained for others on account of their pleasing qualities, though they should not immediately interest ourselves; by which it is distinguished from gratitude. The term is peculiarly applicable to virtuous and amiable dispositions of the heart, such as honesty, integrity, patience, kindness, gentleness, &c. which have no necessary connection with the understanding. It is also applicable to those of whom we have some knowledge, but who are at a remote distance from our intimacy. Thus we esteem the character of a person merely from the report of his good qualities. (*Cogan*, p. 151).

If our esteem be raised by an object which has any thing in it either grand and sublime, or solemn and sacred, it is called reverence or veneration. So we reverence the persons and the counsels of our parents and superiors: we have a veneration for the Holy Bible, for the memory of the prophets and apostles, and for the names of St. Austin and sir Isaac Newton. And when this veneration or high esteem has God for its object, we think with Dr. Watts, that it may be termed adoration or inward worship. (*Watts on the Passions*, § 6.)

ESTE'EMER. *s.* (from *esteem.*) One that highly values; one that sets a high rate upon any thing (*Locke*).

ESTHER, a canonical book of the Old Testament; containing the history of a Jewish virgin, dwelling with her uncle Mordecai at Shushan, in the reign of Ahasuerus, one of the kings of Persia. The great beauty of this maid raised her to the throne of Persia; whereby she had an opportunity to save her countrymen, whose destruction was plotted by Haman, a favourite of that prince. The learned are not agreed who this Ahasuerus was; though the most prevailing opinion is that he was Artaxerxes Longomanus.

ESTHONIA, or Revel, one of the 41 governments into which the Russian empire has been lately divided. It lies on the E. of the Baltic, and is bounded on the N. by the gulf of Finland, on the E. by Ingria, and on the S. by Livonia.

E'STIMABLE. *a.* (French.) 1. Valuable; worth a large price (*Shakspeare*). 2. Worthy of esteem; worthy of honour and respect (*Temple*).

E'STIMABLENESS. *s.* (from *estimable.*) The quality of deserving regard.

To E'STIMATE. *v. a.* (*æstimo*, Latin.) 1. To rate; to adjust the value of; to judge of any thing by its proportion to something else (*Locke*). 2. To calculate; to compute.

E'stimate. *s.* (from the verb.) Computation; calculation (*Woodward*). 2. Value (*Shakspeare*). 3. Valuation; assignment of proportional value; comparative judgment (*L'Estrange*).

ESTIMA'TION. *s.* (from *estimate.*) 1. The act of adjusting proportional value. 2. Calculation; computation. 3. Opinion; judgment (*Bacon*). 4. Esteem; regard; honour (*Hooker*).

E'STIMATIVE. *a.* (from *estimate*) Having the power of comparing and adjusting the preference (*Hale*).

ESTIMA'TOR. *s.* (from *estimate.*) A settler of rates; a computist.

E'STIVAL. *a.* (*æstivus*, Latin.) Pertaining to the summer. 2. Continuing for the summer.

ESTIVA'TION. *s.* (*æstivatio*, Latin.) The act of passing the summer (*Bacon*).

ESTOPPEL, (formed of the French *estouper*, *oppilare*, *obstipare*, to stop or block up,) in law, an impediment or bar of action, arising from a man's own act or deed; against which a man is forbidden, by law, to speak, though it be to say the truth.

ESTOVERS, in law, is used, by Bracton, for that sustenance which a man, committed for felony, is to have out of his lands or goods for himself and his family during imprisonment. In stat. 6 Edw. I. it is used for an allowance in meat or clothes. In some manors, the tenants have common of Estovers; that is, necessary botes or allowances out of the lord's wood: in which last sense, estovers comprehends house-bote, hay-bote, and plow-bote; so that if a man have in his grant these general words, *de rationabili estoverio in boscis*, &c. he may thereby claim all three. Estovers is also used for alimony.

ESTRAC, in the manage, a term applied to a horse that is light-bodied, lank-bellied, thin-flanked, and narrow-chested.

ESTRADE, a French term signifying a public road, or highway. Hence the military term *battre l'estrade*, signifying the sending out scouts to obtain intelligence.

Estrade, is also used for a little elevation on the floor of a room, on which a bed is placed.

To **ESTRA'NGE**. *v. a.* (*estranger*, Fr.) 1. To keep at a distance; to withdraw (*Dryden*). 2. To alienate; to divert from its original use or possessor (*Jeremiah*). 3. To alienate from affection (*Milton*). 4. To withdraw or withhold (*Glanville*).

ESTRA'NGEMENT. *s.* (from *estrange*.) Alienation; distance; removal (*South*).

ESTRAPADE. In the manage, the defect of a horse that will not obey; but which, to get rid of his rider, rises in front, and while his forehand is yet in the air, yerks out furiously with his hind legs, striking higher than his head was before, and during his counter-time going back, rather than advancing.

ESTRAY, or **Stray**, a term applied equally to horse, mare, bull, ox, cow, sheep, or any any head of cattle, that having strayed from its own home, common, waste, or lair, into a strange manor, or lordship, is there found without an owner: in this case, it is an established custom, that such stray be proclaimed, and its marks described, by the common cryer, in the three next nearest towns on the market-day; and if it be not claimed within a year and a day of the time on which it was publicly cried, and described, it becomes the property of the lord of the manor in which it was found. If the owner make the claim within the time limited, it must be returned to him upon his paying reasonable charges for finding, keeping, proclaiming, &c. An estray must be kept without labour, uninjured, and properly fed, till reclaimed, or the time above mentioned be expired.

ESTREAT, in law, *extractum*, a true copy, or note, of some original writing or record, and especially of fines and amercements, and imposed in the rolls of a court, and extracted or drawn out from thence, and certified into the court of Exchequer, from whence process is awarded to the sheriff to levy them: in order, therefore, to be relieved from any fine or estreat, application is made to that court upon motion.

ESTREMADURA, a province of Spain, about 175 miles in length, and 100 in breadth, bounded on the N. by Leon and Old Castile, on the E. by New Castile, on the S. by Andalusia, and on the W. by Portugal. It abounds with corn, wine, and fruits; but the air is bad for foreigners, on account of the excessive heat. It now makes a part of New Castile.

The chief province of Portugal bears the same name. Its capital is Lisbon.

ESTREMOS, a town of Portugal, in the province of Alentejo. It is a large place, and is divided into the upper town and the lower. Lat. 38. 46 N. Lon. 7. 16 W.

ESTRE'PEMENT. *s.* (of the French, *estrepier*.) Spoil made by the tenant for term of life upon any lands or woods (*Cowell*)

E'STRICH. *s.* (commonly written *ostrich*.) The largest of birds (*Sandys*).

E'STUANCE. *s.* Heat; warmth (*Brown*).

E'STUARY. *s.* (*æstuarium*, Latin.) An arm of the sea; the mouth of a lake or river in which the tide reciprocates; a frith. See **Æstuary**.

To **E'STUATE**. *v. a.* (*æstuo*, Latin.) To swell and fall reciprocally; to boil.

ESTUA'TION. *s.* (from *æstuo*, Lat.) The state of boiling; reciprocation of rise and fall; agitation; commotion (*Norris*).

E'STURE. *s.* (*æstus*, Latin.) Violence; commotion (*Chapman*).

E'SULA. (*Esula*, from *esus*, eating, because it is eaten by some as a medicine.) Spurge.

E'sula major. The officinal plant ordered by this name in some pharmacopœias is the euphorbia palustris; umbella multifida, befida, incolucellis ovatis, foliis lanceolatis, ramis sterilibus, of Linnéus. The juice is exhibited in Russia as a common purge; and the plant is given in some places in the cure of intermittents.

E'sula minor. *Tithymalis cyparissus*. Cypress spurge. This, like most of the spurges, is very acrimonious, inflaming the eyes and œsophagus after touching them. It is now fallen into disuse, whatever were its virtues formerly, which, no doubt, amongst some others, was that of opening the bowels, for amongst rustics it was called poor-man's rhubarb.

ESU'RIENT. *a.* (*esuriens*, Latin.) Hungry; voracious.

E'SURINE. *a.* (*esurio*, Latin.) Corroding; eating (*Wiseman*).

ETC. A contraction of the two Latin words *et cœtera*, which signifies, and so on.

To **ETCH**. *v. a.* (*etizen*, German.) A way used in making of prints, by drawing with a proper needle upon a copper-plate, covered over with a ground of wax, and well blacked with the smoke of a link, in order to take off the figure of the drawing; which having its backside tinctured with white lead, will, by running over the strucken outlines with a stift, impress the exact figure on the black or red ground; which figure is afterward with needles drawn deeper quite through the ground; and then there is poured on well tempered aqua fortis, which eats into the figure or drawing on the copper-plate. (*Harris*).

ETCHING, a method of engraving on copper, in which the lines or strokes, instead of being cut with a tool or graver, are eaten in with aqua fortis. (See **Engraving**.) Etching, though not very modern, is a later invention than engraving with the tool; of which it was at first only an imitation, that was practised by painters and other artists, who could much sooner form their hands to, and attain a faculty of, working in this way, than with the graver. But being then, nevertheless, considered as a counterfeit kind of engraving, and therefore inferior to the other, it was cultivated in a very confined manner; the closeness of the resemblance of the work to that performed by the tool being made the test of its merit, and consequently the principal object or aim of those who pursued it. This servile confinement of the art of etching to the imitation of the original kind of engraving was a great cause of retarding its advancement towards perfection, as many of the most able masters cramped their talents with the observance of it: which may be seen in the instances of Sadelers, Swaneberg, Villamena, and particularly Le Bosse; who, in his treatise on engraving, has laid down as a principle, that the perfection of this kind consists in the close similitude of the work with that done by the tool. This absurd prepossession has been since worn out: and the method of working with aqua fortis has been so far improved, that instead of being now deemed a spurious kind of engraving, it evidently appears the foundation of an excellence in many modern works, that could never have been produced without it: since, though the neatness and uniformity of the hatches, which attend the use of the tool, is more advantageous with respect to portraits; yet the liberty and facility of the other manner give a much greater opportunity to exercise the force of genius and fancy in history-engraving; where the effect of the whole, and not the minute exactness in finishing all the parts, constitutes the principal value.

He that would excel in this branch of the arts must be thoroughly acquainted with drawing, otherwise his works will appear tasteless indeed. The ground used in etching is a combination of asphaltum, gum-mastick, and virgin wax, mixed in such proportions as will prevent the asphaltum from breaking the composition when under the aqua fortis, or the wax from making it so soft as to close the lines when cut through it by the needle. As every thing depends upon the stability of the ground, it should be purchased of those persons who are most celebrated for making it; or if the person wishing to use it prefers doing it himself, let him remember that he must keep every particle of grease or oil far from him and his materials, and that without the greatest care the inflammability of the asphaltum will ruin his operations in melting them. The proportions of the ingredients should be obtained by experiment.

After being prepared in the above manner, the ground is tied in a piece of lustring for use, and another piece of the same kind of silk must be made into a dabber by tying a quantity of cotton in it. The copper-plate, hammered to a considerable degree of hardness, polished as if intended for the graver, and perfectly cleansed with whiting, is then secured at one corner by a hand vice, heated over a charcoal fire, and the silk containing the ground rubbed over it till every part is covered by the melted composition; but before it cools the silk dabber must be applied in all directions, till the surface of the plate is thinly and equally varnished. After this part of the process is completed, several lengths of wax taper, twisted together, are to be lighted, the plate raised by the vice in the left hand, and the right holding the burning taper, is to be moved gently backwards and forwards under the ground, carefully avoiding touching it with the wick, yet causing the flame to spread over the surface, which will render it perfectly black, smooth, and shining, in a short time; this is to be ascertained by turning the plate: if the copper appears through the ground, the taper must be applied again immediately; but if it is held too long beneath the plate, the ground will become opaque, and break when the aqua fortis is used.

The next object is to transfer the design to the ground, which may be done by drawing it on thin white paper with a black lead pencil, and having it passed through the copper-plate printer's rolling press, who will accomplish it by laying the plate carefully on the board of his press, the pencilled paper slightly damped on it, and turning the press, the lead will be conveyed firmly to the ground, which will appear in perfect outlines on removing the paper. Another method is to draw the design reversed from the original; rub the back with powdered white chalk, and laying it on the ground, trace the lines through with a blunt point; this operation requires much precaution, or the point will cut the ground; besides, if the paper is not securely fastened with wax at the corners it may slip, and either interrupt the true continuation of lines, or scratch the ground.

In working with the etching needle nothing more is required than to keep it upright, that the lines made by it through the ground may not slope, and thus make the aqua fortis corrode improperly; but it should be particularly observed, that the point, though taper, must be so rounded as to be free from a possibility of its tearing the surface of the copper, which would prevent the progress of the point, and ruin the plate when bitten; the necessary polish of the point may be accomplished by rubbing it on the sole of a shoe. The young artist must now be left to his own exertions, as directions for etching beyond these already given are useless, and he will acquire more knowledge and freedom from copying good prints in one week than a quarto volume of observations would afford. It seems almost needless to add, that every line must be kept distinct, at all events, throughout the plate, and that the most distant should be closer and more regular than those in the fore ground, as the greater the depth of shade, the broader and deeper must the lines be made.

When the etching of the plate is completely finished, the edges of it must be surrounded by a high border of wax, so well secured that water will not penetrate between the plate and it. The best spirits of nitre fortis must then be diluted with water, in the proportion of one part of the former to four of the latter, which will be found to answer the first operations, if the weather is fine and the atmosphere free from moisture; but, if the contrary is the case, the spirits of nitre must be increased in proportion to the humidity of the air; this, when poured on the plate, cannot be too attentively observed in order to remove the bubbles of fixed air with a feather, and to ascertain the time for stopping out the lightest parts; for it must be remembered, the whole secret of biting or corroding any subject consists in the judicious manner in which the depth and breadth of the lines are varied, as by proper management they may be left scarcely perceptible, or increased very considerably. The composition used for the above purpose is, turpentine varnish mixed with lamp-black, and diluted so as to be used freely with a camel's hair pencil; this applied to the parts of the plate sufficiently corroded, will effectually prevent the aqua fortis from touching it again, and the remainder proceeds as if no such application had taken place: it will be necessary to strengthen the water as the work becomes nearer completion, but cautiously, lest the ground should be broken; and every time the aqua fortis is removed, the plate must be washed with clean water and gradually dried, otherwise the varnish cannot be used, and the lines would be clogged with the decomposed metal. For taking the ground from the plate, it is usual to cover the surface with olive oil, and heating it, wipe the plate with a soft piece of old linen and spirits of turpentine, will effectually remove all remaining dirt.

Re-biting, is the art of strengthening those lines of an etching in a plate, from which the original ground has been cleansed. This is done by applying the ground as at first directed, but with great care that the melted composition does not fill, or even partially fill the lines, to prevent which, the cotton wrapt in silk, called the dabber, should be used exclusively by taking a small quantity of melted ground on it, and gently touching the parts between the lines till they are equally and completely covered; if the plate is considerably heated, the ground will spread with more facility over the various interrupted surfaces. Carelessness or inattention will instantly ruin this process, and the whole of the plate: a border of wax must surround the parts to be rebitten, and a channel made to carry off the aqua fortis without injuring those already completed. Supposing the operations of etching and biting the plate entirely finished, nothing more remains than to examine it attentively, and improve it with the graver and dry point.

Stipling, or engraving in the dotted manner, was in a great measure introduced by Bartolozzi, whose works in this way are astonishingly numerous, exclusive of those to which his name is affixed, and not the products of himself. Some pastoral scenes, with figures, when printed in colours, have a pleasing effect; and small portraits, stipled, will bear examination; but historical subjects, which have great breadth of shade, appear to no advantage engraved in this manner. Stipling is performed by etching the plate with dots and biting it, laying the shades with a tool for the purpose, using the graver and the dry point, and scraping off the roughness thus occasioned.

Etching on glass.—Glass resists the action of all the acids, except the fluoric acid. By this, however, it is corroded in the same manner as copper is by aqua fortis; and plates of glass may be engraven in the same manner as copper.

There are several methods of performing this. We shall first describe the mode of etching by means of the fluoric acid in the state of gas. Having covered over the glass to be etched with a thin coat of virgin wax (which is only common bee's wax bleached white), draw the design upon it in the same manner as in etching on copper. Then take some fluor spar, commonly called Derbyshire spar, pound it fine, and put it into a leaden vessel, pouring some sulphuric acid over it. Place the glass with the etched side lowermost over this vessel, two or three inches above it. Apply a gentle heat to the leaden vessel; this will cause the acid to act upon the fluor spar, and disengage the gas, which will corrode the glass. When it is sufficiently corroded, remove the wax by oil of turpentine.

This etching may be also performed by raising a margin of bordering-wax all round the glass, in the same manner as on copper, and pouring on the liquid fluoric acid, which acts upon the glass.

A third method of etching on glass is as follows: Having put the wax on the glass, draw your design, and raise a margin all round it. Then put pounded fluor spar, with some sulphuric acid diluted with water, upon the glass. The sulphuric acid will disengage the fluoric, which will be absorbed by the water, and corrode the glass.

ETEOCLES, in fabulous history, a son of Œdipus and Jocasta. After his father's death, it was agreed between him and his brother, Polynices, that they should both share the royalty, and reign alternately each a year. Eteocles by right of seniority first ascended the throne, but after the first year of his reign he refused to resign to his brother, according to their mutual agreement. Polynices, resolved to punish him, implored the assistance of Adrastus, king of Argos. He received that king's daughter in marriage, and was soon after assisted with a strong army, headed by seven famous generals. Eteocles, on his part, did not remain inactive. He chose seven chiefs to oppose the seven leaders of the Argives, and stationed them at the seven gates of the city. Much blood was shed in light and unavailing skirmishes, and it was at last agreed between the two brothers that the war should be decided by single combat. They both fell, and it is said that the ashes of these two brothers, who had been so inimical one to the other, separated themselves on the burning pile, as if sensible of resentment, and hostile to reconciliation. (*Stat.*).

ETEOCLUS, one of the seven chiefs of the army of Adrastus, in his expedition against Thebes. He was killed by Megareus, the son of Creon, under the walls of Thebes. (*Eurip.*).

ETE'RNAL. *a.* (*æternus*, Latin.) 1. Without beginning or end (*Deuteronomy*). 2. Without beginning (*Locke*). 3. Without end; endless (*Shakspeare*). 4. Perpetual; constant; unintermitting (*Dryden*). 5. Unchangeable (*Dryden*).

ETERNAL FLOWER, in botany. See XERANTHEMUM, GNAPHALIUM, and GOMPHRÆNA.

ETER'NAL. *s.* (*eternel*, French.) One of the appellations of the Godhead (*Hooker*).

ETE'RNALIST. *s.* (*æternus*, Latin.) One that holds the past existence of the world infinite (*Burnet*).

To ETE'RNALIZE. *v. a.* (from *eternal.*) To make eternal.

ETE'RNALLY. *ad.* (from *eternal.*) 1. Without beginning or end. 2. Unchangeably; invariably (*South*). 3. Perpetually; without intermission (*Addison*).

ETE'RNE. *a.* (*æternus*, Latin.) Eternal; perpetual; endless (*Shakspeare*).

ETE'RNITY. *s.* (*æternitas*, Latin.) 1. Duration without beginning or end (*Locke*). 2. Duration without end (*Addison*).

To ETE'RNIZE. *v. a.* (*æterno*, Latin.) 1. To make endless; to perpetuate. (*Milton*). 2. To make for ever famous; to immortalize (*Sidney*).

ETESIÆ, or ETESIAN WINDS (from ἔτος, year). Such as blow at stated times of the year; monsoons, trade-winds.

ETHELBERT, king of England, and second son of Ethelwolf, succeeded his brother in 860. He was a virtuous prince, and greatly beloved by his subjects.

ETHELBERT, king of Kent in 560. He married Bertha, daughter of Caribert king of France. That princess laboured to convert the king to christianity, which however was not accomplished till Austin the monk came to England, being sent hither by pope Gregory. Ethelbert died in 616, aged 56.

ETHELRED, king of England, the son of Edgar, succeeded his brother Edward the Martyr in 978. His kingdom was greatly harassed by the Danes, to whom he meanly paid a tribute, which he levied on his subjects. The tax was called *Dane gelt.* However he was at last roused into revenge by the insolence of the invaders; but, instead of resisting them bravely in the field, he caused them to be treacherously massacred in one day. Swein, king of Denmark, afterwards entered his kingdom, and compelled him to fly to Normandy, but his death happened soon after. Ethelred returned and died in 1016. (*Watkins*).

ETHELWOLF, king of England, came to the crown in 838. He was a mild and religious prince, and went to Rome with his youngest son Alfred, afterwards so renowned. He died in 857, and was buried at Winchester.

E'THER. *s.* (*Æther*, Latin; αιθηρ.) 1. An element more fine and subtile than air; air refined or sublimed (*Newton*). 2. The matter of the highest regions above. See ETHER.

ETHER, in chemistry, (*naphte hunstliche*, Germ.). When alkohol is mixed with sulphuric or several other acids, and the action of the acid is assisted by heat, the alkohol is decomposed, and converted partly into a very light, volatile, fragrant, inflammable liquor called ether. The different acids employed in the production of this liquid are supposed to render it different in some of its properties: and hence the ether produced is denominated from the acid employed, sulphuric ether, nitric ether, fluoric ether, muriatic ether: upon each of which we shall offer a few observations.

Sulphuric Ether.

The preparation of this precedes all the rest in point of time. It is described in the Dispensatory of Valerius Cordus, published at Nuremburg about the year 1540; and, under various processes, has been continued to the present day.

It is usually prepared by the following process. A mixture of equal parts of alkohol and sulphuric acid is put into the retort, to which a large receiver is then luted The receiver should be surrounded with ice, or at least with cold water. Heat is applied, and as soon as the mixture boils the ether comes over and is condensed, and runs in large striæ down the sides of the receiver. As soon as it amounts to one half of the alkohol employed, the process must be stopt. The ether thus obtained is not quite pure, almost always containing a little sulphurous acid. This acid may be separated by pouring the ether on a little potash, or black oxyd of manganese, and distilling over again by means of a moderate heat.

This last process is called *rectification* of the ether. Yet the ether is not quite pure even after all the acid has been removed; it consists of alkohol and ether intermixed, rather than of ether alone. To render it more perfect, the ether is usually mixed with water and then distilled with a moderate heat. But Mr. Lowick has shown that this method does not succeed. The following process yielded him an ether much purer than any that had been previously obtained. Into sixteen parts of ether of the specific gravity 0,775 in a temperature of 60° he threw dry powdered salt of tartar, till the last portions were no longer wetted by the liquor. The mixture being allowed to digest the ether was then drawn off: and its specific gravity was found to be only 0,746. By this mean it was deprived of its water. To remove the alkohol, dry, powdered muriat of lime was thrown into the liquid in the same manner as long as it would dissolve. On standing, the mixture separated into two portions; the alkohol holding the salt in solution, sunk to the bottom; the ether swam on the surface. When separated from the inferior liquor its specific gravity was now only 0,632 in a temperature of 60°. It was therefore much purer than any former ether described by chemists, since it had never before been procured lighter than 0,725. The ether thus prepared contains a little of the salt from which it may be freed by distillation. But in such case its specific gravity increases; the purest portion of the ether assuming the form of elastic fluid.

Ether thus obtained is a limpid and colourless liquor, of a hot pungent taste, highly fragrant, and so volatile that it can scarcely be poured from one vessel to another without sustaining considerable loss by evaporation.

When exposed to a cold of —46° ether freezes and crystallizes. In moderate temperatures it is not affected by oxygen gass or common air; but when kindled in a state of vapour, it burns rapidly with a fine white flame, and leaves behind it a trace of charcoal. In the state of vapour it also detonates with common air and oxygen gass; and when, in this state, made to pass through a red hot porcelain tube, it is decomposed completely, and a large quantity of carbureted hydrogen gass is obtained.

Of the simple combustibles ether seems to act only on phosphorus and sulphur. It has no action on metals, but revives those that have a weak affinity for oxygen when mixed with their solution in acids, as gold and silver. It dissolves the muriat of gold and the oxymuriat of mercury. It absorbs nitrous gass in considerable quantity; and sulphuric gass seems capable of converting it into a peculiar kind of oil known by the name of sweet oil of wine. It dissolves the fixed and volatile oils, fluid bitumens, and resins; but it does not act upon gum.

Nitric Ether.

This is first mentioned in an epistle written by Kunkel to Voight, and published in 1681, but no attention was paid to it by succeeding chemists till it was discovered a second time by Navier in 1742, and a third time by Sebastiani in 1746. Navier's method of obtaining it is hazardous: Dr. Black invented a better process. Dehne attempted to improve upon Dr. Black's; and various other methods have since been devised; but the process at present most approved is that of Chaptal as corrected by Proust. A large retort is luted to a glass globular vessel furnished with a safety-tube. From this globe a tube passes to a second globe, likewise furnished with a safety-tube; and to this last vessel is connected three Woulfe's bottles in the usual way, which must be half full of alkohol. A mixture of 38 parts of alkohol and 24 of acid, of the specific gravity of 1,3, is put into the retort. The heat of a chafing-dish is applied, and removed as soon as the effervescence begins. The greatest part of the ether is detained by the alkohol in the first Woulfe's bottle; which mixture is to be saturated with an alkali, and the ether separated by distillation. Nitrous ether, by whatever process it is procured, is never pure at first, holding always in solution a considerable portion of nitrous gass; and hence its extraordinary volatility. It contains also a certain portion of nitric acid, and a little oil, to which it owes its yellow colour. The nitrous gass separates spontaneously when the ether is mixed with a considerable portion of water. By distilling it repeatedly from potash or sugar the oil may be abstracted, and when kept for some time the nitric acid is decomposed, and a little water and oxalic acid formed, which sink to the bottom of the vessel.

As far as it is known, nitric ether agrees very nearly in its properties with sulphuric ether: it is equally fluid and combustible, but it is heavier, the specific gravity being often 0,9000. Its taste and odour are nearly the same as those of sulphuric ether, but not quite so pleasant, owing, most probably, to the foreign bodies, from which it cannot easily be completely freed.

Nitrous ether appears capable of uniting with nitrous gass in two proportions. When the ether is in excess it forms nitrous ether in the state in which it appears previous to rectification; when the nitrous gass exceeds the ether it composes a permanently elastic fluid that has obtained the name of *etherised nitrous gass*. The preparation of this differs from that of nitrous ether only in the rapidity with which the acid and alkohol act on each other; when the combination takes place very slowly much ether and little etherised gass is the result, but when the contrary is the case these two products are formed in an inverse proportion. If equal parts of alkohol and strong nitrous acid be mixed together at the usual atmospheric temperature, or at a higher heat in proportion as the acid is diluted, a very rapid and copious effervescence takes place, a little ether is condensed in the receiver, and a large quantity of gass passes through the conducting tube, the first portions of which are etherised nitrous gass, and the latter part common nitrous gass. What remains in the retort is acetous acid, with a little oxalic acid.

Muriatic Ether.

After the discovery of the two preceding ethers various attempts were made to obtain ether by the action of muriatic acid on alkohol. But by employing this acid alone no ether has been or perhaps can be obtained: for in its usual state it is too much diluted with water to act with much energy upon alkohol. To obtain muriatic ether, therefore, it is necessary to employ the acid in a different state. Renelle discovered that muriatic ether might be obtained by distilling together alkohol and the smoking liquor of Libavius, which is a concentrated muriat of tin in its highest state of oxydation, which Dr. Thomson denominates a peroxyd. The marquis of Courtanvaux having repeated the experiments of Renelle with much care, proposes the following as the best method of preparation.

Mix together in a retort three parts of fuming muriat of tin and one of alkohol, a considerable degree of heat is immediately excited, and a white suffocating vapour arises, which, however, soon disappears on agitating the mixture. As soon as an ethereous odour is perceived, let two balloon receivers be luted on and kept as cool as possible, then by the application of a gentle heat to the retort there comes over first a little dephlegmated alkohol which is succeeded by the ether: by an increase of temperature a few drops of coloured oil are produced, and then arises partly in the form of soft butter, and partly in that of a dense brown liquid, a quantity of smoking muriat of tin, part of the metallic oxyd remaining in the retort as a grey powder. When the ether thus produced is mixed with a solution of pearl-ash, a copious effervescence and precipitation takes place, owing to the decomposition of some muriat of tin contained in the ether, after which by distillation at a gentle heat the muriatic ether arises in a state of great purity, amounting to half of the impure product of the first distillation.

Several other metallic muriats have been found to be equally efficacious with the liquor of Libavius: the corrosive muriats of antimony and arsenic, the muriats of bismuth and zinc, and the red muriat of iron, have in particular been used with success in the preparation of muriatic ether.

Another method of obtaining muriatic ether is as follows, which is the plan recommended by Mr. Basse. Keep a quantity of common salt for an hour in a state of fusion, in order to deprive it of its water of crystallization. Put twenty parts of this salt into a tubulated retort, to the beak of which is fitted a bent tube, plunging into a Woulfe's bottle, containing ten parts of alkohol as strong as possible. Introduce into the retort, in small quantities at a time, ten parts of the most concentrated sulphuric acid, allowing the common air to escape from the bottle containing the alkohol: then distil in a sand-bath till the muriatic acid comes over, keeping the alkohol bottle as cool as possible during the process. The alkohol, thus saturated with acid, is put into a retort, and one half of it distilled over. Agitate this portion with an alkaline ley, and then decant the ether which swims on the surface: it usually amounts to two and a half parts.

After the discovery of the oxymuriatic acid Scheele shewed that ether might be obtained by distilling a mixture of alkohol, black oxyd of manganese and muriatic acid; or by distilling sulphuric acid, common salt, black oxyd of manganese, and alkohol: but the quantity which can be obtained by this process is trifling; for the oxymuriatic acid acts upon the ether formed, and converts it into a kind of oil.

Muriatic ether is transparent, colourless, and volatile like sulphuric ether, from which it only differs in the two following particulars: when burnt it exhales an acrid odour like that of sulphurous acid; and its taste is astringent like that of alum. These peculiarities are probably owing to the introduction of some extraneous body. Its specific gravity is about 0,719.

Fluoric Ether.

All we know of this substance is derived from Scheele. He first impregnated rectified alkohol with fluoric gass by distilling pulverised fluor spar with sulphuric acid, and placing alkohol in the receiver; the smoking spirit thus obtained was distilled with a gentle heat, but no sign of ether made its appearance. Another portion of the acidulated spirit was then mixed with black oxyd of manganese, and by subsequent distillation an ethereous fluid came over; from which by rectification a little ether was obtained, of a very agreeable smell, resembling that of nitrous ether.

Acetic Ether.

This was first obtained by the Count de Lauraguais in 1750, who prepared it by distilling together equal parts of alkohol and acetic acid. Scheele, Bergman, and Porner, tried this method, but failed. Pelletier, however, has abundantly proved the accuracy of Lauraguais' experiments, and at the same time pointed out the cause of Scheele's failure. Yet though Scheele did not succeed by this mode, he pointed out and amply succeeded by another and a much simpler process. Nothing more upon Scheele's own method is necessary than to mix acetit of pot-ash or of lead (sugar of lead) or of copper (distilled verdigris) with alkohol, and then adding as much sulphuric acid as is requisite to decompose the acetous salt, distil the mixture at a low heat, and shake the produce with water; when the ether will rise to the surface, and may be poured off. From sixteen parts of sugar of lead, six parts of strong sulphuric acid, and nine parts of alkohol, Bucholz obtained six parts of pure rectified ether.

Acetic ether has the properties of the other ethers, excepting only that the odour of acetic acid is perceptible in it.

Various other acids have been distilled with alkohol for the purpose of procuring ether, but with little or no success: such as the phosphoric, boracic, benzoic, tartaric, citric, succinic, and arsenic. A liquid lighter than alkohol has been obtained from some of them, but still soluble in water, and therefore not an ether.

The different species of ether have not been examined with sufficient care: but it is now generally, though perhaps improperly, conceived that pure ether, however, obtained is one and the same, and that the differences manifested are only owing to foreign substances with which the ether is contaminated.

ETHE'REAL. *a.* (from *ether.*) 1. Formed of ether (*Dryden*). 2. Celestial; heavenly (*Milton*).

ETHE'REOUS. *a.* (from *ether.*) Formed of ether; heavenly (*Milton*).

ETHEREGE (George), an English dramatic writer, born about 1636, of an ancient family in Oxfordshire. In 1664 he produced a comedy, called, The Comical Revenge; or, Love in a Tub, which introduced him to the friendship of the greatest wits of the age. Encouraged by the favourable reception of this piece, he brought out another in 1668, entitled, She would if she could, which also met with considerable success. In 1676 appeared his Man of Mode, or Sir Fopling Flutter, which seems to be his best performance. He received the honour of knighthood about 1683, and married a rich old widow. He was a man of licentious habits, and broke his neck, it is said, by falling down stairs when intoxicated at Ratisbon. His songs are very sprightly.

ETHERIAL OIL. Any highly rectified essential oil.

ETHERIFICATION (Theory of). As chemists of different periods and different schools have entertained various opinions concerning the nature of ether, the theories by which they have endeavoured to account for its production have differed accordingly. The theories which have attracted most attention are those of Macquer, Lavoisier, and Vauquelin.

The first conceived ether to be alkohol in its utmost purity, deprived by the acid employed of the whole of its waters. Upon this hypothesis, the acid does not enter into the ether as a component part; which was, nevertheless, the common opinion at the time, and has since been confirmed by experiments; while it takes no notice of the copious deposition of charcoal, and the formation of acetous acid during the production of ether.

When the theory and general deductions of Lavoisier began to be received among chemists, oxygen was at once regarded as the active principle in the formation of ether, as well as of every other chemical substance: and hence, according to Lavoisier, ether is alkohol combined with oxygen. This theory, however, has proved just as unsatisfactory as the preceding; for were it true, ether might be obtained from any other substances possessing oxygen, and combined with alkohol, as well as from acids; and this indeed was expressly asserted by Lavoisier, who affirmed, that it might also be procured by repeated distilliations of alkohol from the red oxyd of mercury; an assertion, however, which is now well known to be unfounded, unless the oxyd be prepared in a particular way, as for example by nitrous acid, and with the acid undecomposed, from having been insufficiently heated.

A new, and, upon the whole, a more satisfactory theory, has since been advanced by Fourcroy and Vauquelin, which leads to the conclusion that, during the etherial process, the alkohol is completely decomposed, and that ether is compounded of the same principles or ingredients, but in different proportions; that it contains a greater proportion of hydrogen and oxygen, and a smaller proportion of carbon than alkohol.

The theory upon which these conclusions are drawn, and which appeals to various phænomena uniformly taking place, upon a mixture of different proportions of alkohol with different proportions of sulphuric acid, is as follows:

1. A small quantity of ether is formed spontaneously, and without the assistance of heat, by the combination of two parts of concentrated sulphuric acid, and one part of alkohol.

2. As soon as ether is formed, there is a production of water at the same time, and while the first of these compositions takes place, the sulphuric acid undergoes no change in its intimate nature.

3. As soon as the sulphurous acid appears no more, or at least very little more, ether is formed; but the sweet oil of wine passes over, together with water and acetic acid.

4. The sweet oil of wine having ceased to come over, nothing further is obtained but the sulphurous and carbonic acids, and at last sulphur, if the distillation be carried to dryness.

The operation of ether is, therefore, naturally divided into three periods; the first in which a small quantity of ether and water are formed without the assistance of heat; the second in which the whole of the ether which can be obtained is disengaged without the accompaniment of sulphurous acid; and the third, in which the sweet oil of wine, the acetous acid, the sulphurous acid, and the carbonic acid are afforded. The three stages have no circumstance common to all but the continual formation of water, which takes place during the whole of the operation.

This theory has been opposed by Zaudet and Dabit; but the objections thus far advanced have been satisfactorily replied to by its inventors; though their explanation is not sufficiently precise to ascertain exactly the component parts of ether. The process for producing this compound we have given under the article Ether, which see.

E'THICAL. *a.* (ηθικος.) Moral; treating on morality.

E'THICALLY. *ad.* According to the doctrine of morality (*Government of the Tongue*).

E'THIC. *a.* (ηθικος.) Moral; delivering precepts of morality.

ETHICS, the doctrine of manners, or the science of moral philosophy. The word is formed from ηϑος, ηϑη, *mores*, manners, because the scope or object thereof is to form the manners.

By manners or morals is here meant a way or manner of living confirmed by custom or habit, or certain habitudes of doing, or actions which are often repeated, which, if they be according to right reason, the morals or manners are said to be good, otherwise, evil and vicious.

Hence the object of ethics is the exercise of right reason in all our affairs, actions, and relations; or it is man himself considered as dirigible, and to be conducted according to reason; and the end of ethics is to make him good and happy: so that if a man conducted himself according to right reason in all the circumstances of his actions, affairs, and relations, he would arrive at the highest pitch of moral perfection and beatitude.

Whence ethics may be defined a right manner of thinking in order to attain to human felicity, or a science whereby man is directed to conduct his will, and the actions thereof, so as to live well and happily.

The principal, nay, the only topics thereof, are happiness and manners, whence arise two parts or branches of ethics; the first, on moral happiness, considered as the end; and the second on moral virtues or good manners, as the means to arrive at that end.

It has not been unusual, of late, for persons to object to the science of ethics, or morality, as an abstruse and useless speculation, a mere amusement of the mind, presenting us only with ingenious hypotheses, and specious conjectures, more calculated to lead a man to endless doubts and perplexities, than to settle him in a state of solid and lasting satisfaction. On the contrary, however, we hesitate not to assert that it is of the utmost importance to mankind, that it lies level to the apprehensions of the weakest minds, provided they are sincere and well-disposed, and that it is attended with all the certainty that any impartial and considerate person can desire.

An admirable writer (Cumberland, De Leg. N. C. 4.) forms an ingenious comparison between algebra and morality, as to the method of finding out truth, and teaching it when found: he judiciously observes, that in external operations, where the question is often perplexed by the multiplicity of circumstances, our not being able always to arrive at precise determinations, no more affects the certainty of morality, than it does the truth and usefulness of the principles of geometry about the measuring of lines, surfaces, and solids, that neither by the senses nor the help of instruments is it possible to effect a line perfectly straight, or a surface perfectly plane or spherical, or a body perfectly regular. It is enough that we approach so near to the utmost exactness, that nothing of any moment to human practice is wanting. And so much may be attained by the principles of moral doctrine. The method, the rules of operations, and the way of deducing one thing from another, are the same (in morality as in mathematics), neither do the uses of life require a complete accuracy any more than the same is necessary in measuring planes and solids.

The celebrated Puffendorf has also remarked, that moral qualities, as they are not capable of being adjusted in their mutual proportions with so much exactness as physical quantities are, so they do not need such a precision, but allow of a latitude. Thus in estimating the merit of persons, the value of things and actions, the proportion of the punishment to the crime, and in the exercise of the greater part of the virtues, except justice, as liberality, gratitude, equity, charity, &c. there is a certain latitude or extent. It cannot be denied that the nature of the subject matter is different in moral and mathematical sciences; and according to this difference in the subject, there is a like difference in the kind of evidence: but from this it will by no means follow, that because the evidence to be expected in morality is not the same as that of the mathematics, that therefore it is not satisfactory.

Ethics give satisfaction, where it is most of all desirable, in the enquiry after happiness. It has been already observed, that one great end of ethics is happiness; and will any one say that happiness is an impossible attainment? A most wise and good God hath made ample provision for other creatures, that they might reach the ends to which they incline, and for which by their several natures he hath fitted them; and it is hard to conceive that man only should be under a necessity of falling short of the happiness of which he is capable. It is possible for God to make man happy; the thing does not imply a contradiction; nor is there are any insurmountable incapacity in the subject to oppose it; for, being furnished both with understanding and will, man wants not the principles of fruition. And who can doubt but that infinite power can supply objects of enjoyment adequate to the faculty? Certain it is then that God can make man happy; and because he is infinitely good, we are justified in inferring that he will do it, with this only condition, that man be not wanting to himself. See the Introduction to Grove's Moral Philosophy, where many other arguments are urged to the same purpose, and the most prominent objections are answered.

ETHIOPIA, a celebrated, though very much unknown empire of Africa, whose boundaries have never been exactly defined either by ancient or modern geographers. By some writers of antiquity the title of Ethiopians was given to all nations whose complexion was black: hence we find the Arabians as well as many other Asiatics sometimes falling under this denomination; besides a number of Africans, whose country lay at a distance from Ethiopia, properly so called. Thus the Africans in general were by these writers divided into the Western or Hesperian Ethiopians, and those above Egypt situated to the east of the former; the latter being much more generally known than the former, by reason of the commerce they carried on with the Egyptians. But there was one country to which the title was thought most properly to belong, and which was therefore called Ethiopia Propria. This was bounded on the north by Egypt, extending all the way to the less cataract of the Nile, and an island named Elephantine; on the west it had Libya interior; on the east the Red Sea, and on the south unknown parts of Africa; though these boundaries cannot be fixed with any kind of precision. In this country the ancients distinguished a great variety of different nations, to whom they gave names either from some personal property, or from their manner of living.

ETHIOPS ANTIMONIAL. See SULPHURETUM HYDRARGYRI STIBIATUM NIGRUM.

ETHIOPS MINERAL. See HYDRARGYRUS CUM SULPHURE.

Ethiops per se. See Oxydum hydrargyri nigrum.

ETHMOID BONE. (*os ethmoideum*, from ηθμος, a sieve, and ειδος, form; because it is perforated like a sieve.) Os ethmoides. Os æthmoides. Cribriform bone. A bone of the head. It is situated anteriorly in the basis of the cranium, at the upper part of the nose. The principal eminences and depressions of this bone are the crista galli, the perpendicular septum, the spongy laminæ, and the cribrose foramina.

ETHNARCHA, Ethnarch. (formed of εθνος, nation, and αρχη, command, a governor or ruler of a nation.) There are some medals of Herod I. surnamed the Great, on one side whereof is found Ἡρωδου, and on the other Εθναρχου, q. d. Herod the ethnarch. Josephus gives Herod the appellation of tetrarch, in lieu of that of ethnarch.

ETHNIC. *a.* (εθνικος.) Heathen; pagan; not Jewish; not christian (*Grew*).

ETHNICS. *s.* Heathens (*Raleigh*).

ETHNOPHRONES, a sect of heretics in the seventh century, who made a profession of Christianity, but joined thereto all the ceremonies and follies of paganism.

ETHOLO'GICAL. *a.* (ηθος, and λογος.) Treating of morality.

ETHU'LIA, in botany, a genus of the class syngenesia, order polygamia æqualis. Receptacle naked; seeds crowned with a membranaceous margin; calyx equal. Seven species; natives of the East or West Indies.

ETIENNE (St.) a city of France, in the department of Rhone and Loire, remarkable for its manufactures in iron and steel, and for its ribands. Lat. 45. 22 N. Lon. 4. 30 E.

ETIO'LOGY. *s.* (αιτιολογια.) An account of the causes of any thing, generally of a distemper (*Arbuthnot*).

ETIQUETTE, a French term, primarily denoting a ticket or title affixed to a bag or bundle of papers, expressing its contents. It is also used, when applied to the Spanish and some other courts, to signify a particular account of what is to be done daily in the king's household, and in the chief ceremonies relating to it. It likewise denotes those forms that regulate the decorum of conduct towards persons of various ranks and stations in life.

ETNA, or Ætna, a famous burning mountain of Sicily, and the largest in Europe. The form of mount Etna is that of a cone, very broad at the base, which is more than forty miles in circumference. From the bottom you ascend ten leagues before reaching its summit on the south side; and on any of the other sides, the way being not so straight, would be considerably longer. Etna is entirely composed of substances that have been discharged from the volcano in its various explosions.

It appears from the quantities of marine bodies deposited all over the under part of Etna, that it must have been once covered by the sea to at least one half of its present height. The whole island of Sicily, and the greatest part of mount Etna, have been, in M. Houel's opinion, formed under water. But the period when the eruptions from this volcano first commenced, the manner in which the sea subsided, and the precise time at which it fell so low as the present level on the shores of Sicily, are facts concerning which we have no certain knowledge. The general principle, however, that author thinks may be regarded as undeniable.

When the sea subsided from mount Etna, the mountain must have been covered over with such matters as the sea usually deposits; consequently with calcareous substances. A part of those matters would be indurated by the action of the atmosphere, while the rest would be carried down by the rain-waters, and again conveyed into the ocean. The torrents of rain-water which pour down the sides of mount Etna, have furrowed its sides, by cutting out for themselves channels; and they have removed from its summit, and are still removing to a farther distance, all the extraneous bodies upon it. In many places, they flow at present over a channel of lava, having cut through all the matters which lay above it: still, however, there remain in many places, both calcareous matter and other marine productions, which show that this volcano has been once covered by the waters of the ocean. But these are daily wasting away; not only by the rains, but by men likewise, who carry them off as materials for lime and for building.

The lower parts of Etna present to the eye very extensive plains entirely covered with lava of different thickness, on which vegetation has not yet made any progress. The nearer the shore the more barren is the ground; while the fertility of the soil increases as we advance farther inwards. The mountain is every where full of vast excavations; which our author considers as a proof, that instead of increasing in bulk, it is actually in a state of decay and diminution. The vast torrents of lava, which overspread the sides of it from time to time, he considers as insufficient to repair the waste occasioned by rains, rivulets, and torrents flowing down from the summit. Unless the eruptions, therefore, become more frequent than they have been for some time past, M. Houel supposes that, by degrees, the height of the mountain must be reduced to that of the surrounding beds of lava. He had not an opportunity of measuring the altitude of Etna himself; but he observes that it had been done by the celebrated M. de Saussure, who found the elevation to be 10,036 feet. This was done on the 5th of June, 1773, at twenty minutes after seven in the morning. The height of the barometer on the most elevated part at the brink of the crater, was 18 inches $11\frac{3}{4}$ lines; which, by the necessary corrections, is reduced to eighteen inches $10\frac{11}{12}$ lines. At the same time the mercury at Catania, placed only one foot above the level of the sea, stood at 28 inches $2\frac{1}{16}$ lines; which must be reduced to 28 inches $1\frac{1}{8}$ lines, n account of the necessary corrections for the hermometer.

Four of the mouths of this mount appear to be composed of a reddish pozzolano, which has procured it the name of the Red Mountain: but when we ascend the pyramids, or rather funnels, which they form, we find them composed of different coloured layers of sand. Some of these are of a blueish grey colour, others of a fine yellow, and some of a kind of green, formed by a mixture of grey and yellow, while others are of a red colour. A great number of small crystals, black schoerls, and granites, are found among them, as well as pieces of scoria, which had been discharged from the volcano in the form of a thick and glutinous matter. All these mouths have internally the form of a funnel, and their shape is nearly that of a mutilated cone or round pyramid. This is the natural and unavoidable consequence of the perpendicular fall of the pulverised matter which the volcano discharges from the orifice at the bottom. The sides of the craters are not all of one height; the parts to the east and west being considerably higher than the intermediate summits, because the currents of the ashes passed alternately from east to west, and fell upon these sides in greater quantities than on the others; which circumstance has given to this volcano the appearance of having two summits.

The majestic forests which surround Etna afford a singular spectacle, and bear no resemblance to those of other countries. Their verdure is more lively, and the trees of which they consist are of a greater height. These advantages they owe to the soil whereon they grow; for the soil produced by volcanoes is particularly favourable to vegetation, and every species of plants grows here with great luxuriance. In several places where we can view their interior parts, the most enchanting prospects are displayed. The hawthorn trees are of an immense size. Our author saw several of them of a regular form, and which he was almost tempted to take for large orange-trees cut artificially into the figures they represented. The beeches appear like so many ramified pillars, and the tufted branches of the oak like close bushes impenetrable to the rays of the sun. The appearance of the woods in general is exceedingly picturesque, both because of the great number and variety of the trees, and the inequality of the ground, which makes them rise like the seats in an amphitheatre, one row above another; disposing them also in groups and glades, so that their appearance changes to the eye at every step: and this variety is augmented by accidental circumstances, as the situation of young trees among others venerable for their antiquity; the effects of storms, which have often overturned large trees, while stems shooting up from their roots, like the Lernæan hydra, show a number of heads newly sprung, to make up for that which was cut off.

Etna abounds very much with springs, fountains, and even rivers of considerable magnitude. M. Houel has computed, that if all the water flowing down the sides of this mountain were collected, it would fill the channel of a river thirty-six feet broad, and six in depth. Many of the springs afford fine salt; some are very pure, and others are impregnated with noxious substances; while others are remarkable for their use in dyeing particular colours.

It has been a question, whether the eruptions of mount Etna were more frequent in ancient than in modern times? At first it seems impossible to give a precise answer to such a question; but when we consider, that the matter in the volcanic focus was then greater in quantity than at present, in proportion to the space which it occupied; that the cavities were then sooner filled with vapour; and that the centre of the focus was then less remote, we need not hesitate to pronounce, that in earlier times the eruptions were more frequent as well as more copious.

Mount Etna, as we have already remarked, has been a celebrated volcano from the remotest antiquity. Diodorus Siculus mentions eruptions of it as happening 500 years before the Trojan war, or 1693 years before the Christian æra. From Homer's silence with regard to the phenomenon of Etna, it is to be presumed that the volcano had been many ages in a state of inactivity, and that no tradition of its burning remained among the inhabitants at the time he composed his Odyssey; perhaps it never had emitted flames since the country was peopled. The first eruption taken notice of by ancient, but by no means contemporary, authors, happened before the Greeks landed on the island, and is supposed to have scared the Sicani from the east part of Sicily.

Pindar is the oldest writer extant who speaks of Etna as a volcano. The first recorded eruption was in the time of Pythagoras. Plato was invited by the younger Dionysius to examine the state of the mountain after the sixth. It threw up flames and lava near an hundred times between that period and the battle of Pharsalia: it was particularly furious while Sextus Pompeius was adding the horrors of war to its devastations. Charlemagne happened to be at Catania during one of the eruptions; and from his reign the chronicles mention fifteen down to that of the year 1669, the most terrible of them all. Since 1669 there have been several eruptions, but none of them comparable to it. In that which happened in 1766, the lava sprung up into the air to a considerable height. twelve miles below the summit; but formed a stream only six miles in length and one mile in breadth.

A considerable eruption happened in 1787. From the 1st to the 10th of July, there were signs of its approach. On the 11th, after a little calm, there was a subterraneous noise, like the sound of a drum in a close place, and it was followed by a copious burst of black smoke. It was then calm till the 15th, when the same prognostics recurred. On the 17th, the subterraneous noise was heard again; the smoke was more abundant, slight shocks of an earthquake followed, and the lava flowed from behind one of the two little mountains which form the double head of Etna. On the 18th, while the spectators were in anxious expectation of a more severe eruption, all was quiet, and continued so more than twelve hours: soon after, they perceived some new shocks, accompanied with much noise; and the mountain threw out a thick smoke, which, as the wind was westerly, soon darkened the eastern horizon; two hours afterwards a shower of fine black brilliant sand descended: on the east side it was a storm of stones; and, at the foot of the mountain, a deluge of flashes of fire, of scoria and lava.

These appearances continued the whole day; at the setting of the sun the scene changed. A number of conical flames rose from the volcano; one on the north, another on the south, were very conspicuous; and rose and fell alternately. At three in the morning, the mountain appeared cleft, and the summit seemed a burning mass. The cones of light which arose from the crater were of an immense extent, particularly the two just mentioned. The two heads seemed to be cut away; and at their separation was a cone of flame, seemingly composed of many lesser cones. The flame seemed of the height of the mountain placed on the mountain; so that it was probably two miles high, on a base of a mile and a half in diameter. This cone was still covered with a very thick smoke, in which there appeared very brilliant flashes of lightning, a phenomenon which Etna had not before afforded. At times, sounds like those from the explosion of a large cannon were heard, seemingly at a less distance than the mountain. From the cone, as from a mountain, a jet of many flaming volcanic matters was thrown, which were carried to the distance of six or seven miles: from the base of the cone a thick smoke arose, which, for a moment, obscured some parts of the flame, at the time when the rivers of lava broke out. This beautiful appearance continued three quarters of an hour. It began the next night with more force: but continued only half an hour. In the intervals, however, Etna continued to throw out flames, smoke, stones ignited, and showers of sand. From the 20th to the 22d, the appearances gradually ceased. The stream of lava was carried towards Bronte and the plain of Lago.

After the eruption, the top of the mountain on the western side was found covered with hardened lava, scoria, and stones. The travellers were annoyed by smoke, by showers of sand, mephitic vapours, and excessive heat. They saw that the lava which came from the western point divided into two branches, one of which was directed towards Libeccio; the other, as we have already said, towards the plain of Lago. The lava on the western head of the mountain had, from its various shapes, been evidently in a state of fusion; from one of the spiracula, the odour was strongly that of liver of sulphur. The thermometer, in descending, was at 40 degrees of Fahrenheit's scale; while near the lava, in the plain of Lago, it was 140 degrees. The lava extended two miles; its width was from 12 to 13¼ feet, and its depth 13¼ feet.

A variety of particulars respecting this celebrated mountain may be found in different volumes of the Philosophical Transactions. See also ÆTNA.

ETOLIA, a country of ancient Greece, comprehending all that tract now called the Despotat, or Little Greece. It was parted on the east by the river Evenus, now the Fidari, from the Locrenses Ozolæ: on the west, from Acarnania by the Achelous; on the north, it bordered on the country of the Dorians and part of Epirus; and, on the south, extended to the bay of Corinth.

ETON, a town of Buckinghamshire, opposite Windsor. It is seated on the Thames, over which there is a bridge. Lat. 50. 30 N. Lon. 0. 36 W. Here is a college, which was founded by Henry VI. for the support of a provost and seven fellows, one of whom is vice-provost, and for the education of seventy king's scholars, as those are called, who are on the foundation. These, when properly qualified, are elected, on the first Tuesday in August, to King's college, Cambridge, but they are not removed till there are vacancies in the college, and then they are called according to seniority; and after they have been three years at Cambridge they claim a fellowship. Besides those on the foundation, there are seldom less than three hundred scholars, and often many more, who board at the masters houses, or within the bounds of the college. The school is divided into upper and lower, and each of these into three classes. To each school there is a master and four assistants or ushers. The revenue of the college is about 5000*l.* a year. Here is a noble library, and in the great court is a fine statue of the founder, erected at the expence of a late provost, Dr. Godolphin, dean of St. Paul's. The chapel is in a good style of Gothic architecture. The schools and other parts, which are in other styles of building, are nearly as good, and seem like the design of Inigo Jones.

At Eton there is a singular festival, celebrated triennially (formerly duennially) by the scholars of the school upon Whit Tuesday, for the benefit of the captain or head-boy of the school for the time being, and thence called Montem, i. e. *Mon-tem,* "my turn, or season." The following account of this festival, taken from the Monthly Magazine, will probably be acceptable to many of our readers.

It commences by a number of the senior boys taking post upon the bridges or other leading places of all the avenues around Windsor and Eton soon after the dawn of day. These youths so posted, are chiefly the best figures, and the most active of the students; they are all attired in fancy dresses of silks, satins, &c. and some richly embroidered, principally in the habits or fashion of running footmen, with poles in their hands; they are called salt-bearers, and demand salt, i. e. a contribution from every passenger, and will take no denial.

When the contribution is given, which is *ad libitum*, a printed paper is delivered with their motto and the date of the year, which passes the bearer free through all other salt-bearers for that day, and is as follows, viz.

"Pro more et monte,
1809, (or the year of the ceremony),
Vivant rex et regina."

These youths continue thus collecting their salt at all the entrances for near seven miles round Windsor and Eton, from the dawn of day until about the close of the procession, which is generally three o'clock in the afternoon.

The procession commences about twelve o'clock at noon, and consists of the queen's and other bands of music; several standards borne by different students; all the Etonian boys, two and two, dressed in officers uniforms; those of the king's foundation wearing blue, the others scarlet uniforms, swords, &c.

The grand standard-bearer.

The captain, or head boy of Eton school.

The lieutenant, or second boy.

His majesty, attended by the prince of Wales, and other male branches of the royal family on horseback, with their suite.

The queen and princesses in coaches, attended by their suite.

Band of music, followed by a great concourse of the nobility and gentry in their carriages and on horseback.

The procession commences in the great square at Eton, and proceeds through Eton to Slough, and round to Salt Hill, where the boys all pass the king and queen in review, and ascend the Montem: here an oration is delivered, and the grand standard is displayed with much grace and activity by the standard bearer, who is generally selected from among the senior boys.

There are two extraordinary salt-bearers appointed to attend the king and queen, who are always attired in fanciful habits, in manner of the other salt-bearers already described, but superbly embroidered. These salt-bearers carry each an embroidered bag, which not only receives the royal salt, but also whatever is collected by the out-stationed salt-bearers. The donation of the king and queen, or, as it is called upon this occasion, the royal salt, is always fifty guineas each; the prince of Wales thirty guineas; all the other princes and princesses twenty guineas each. As soon as this ceremony is performed, the royal family return to Windsor. The boys are all sumptuously entertained at the tavern at Salt Hill; and the beautiful gardens at that place are laid out for such ladies and gentlemen as choose to take any refreshments, the different bands of music performing all the time in the gardens.

About six o'clock in the evening, all the boys return in the same order of procession as in the morning (with the exception only of the royal family), and, marching round the great square in Eton school, are dismissed. The captain then pays his respects to the royal family at the queen's lodge, Windsor, previous to his departure for King's college, Cambridge; to defray which expence, the produce of the Montem is presented to him. Upon Whit Tuesday, in the year 1796, it amounted to more than 1000 guineas. The day concludes by a brilliant display of beauty, rank, and fashion, a promenade on Windsor terrace, bands of music performing, &c. and the scene highly enlivened and enriched by the affable condescension of the royal family, who indiscriminately mix with the company, and parade the terrace till nearly dark.

ETRURIA, a village in Staffordshire, near Newcastle. It is the principal seat of the potteries in this county. Here was first made that excellent English ware, known by the name of Wedgewood's ware, from its inventor, the late Josiah Wedgewood, esq. Kuttner, the author of Travels through Germany, &c. speaking of the inns in Sweden, says, "Here the plates and dishes are of Staffordshire ware, or as it is called in Germany, English stoneware. It would be difficult to name the man who ever instituted for his country so prodigious an article of commerce as Wedgewood, in bringing the earthenware to such a pitch of perfection; and which is used from one extremity of Europe to the other, as the general table service, both by the rich, and by the poor. It is one of the greatest things that any one man ever yet performed."

ETTRICK, a river in Selkirkshire, which rises from the mountainous region in the S.W. and having formed a junction with the Yarrow, their united streams meet the Tweed, where that river enters Roxburghshire.

ETYMOLO'GICAL. *a.* (from *etymology.*) Relating to etymology (*Locke*).

ETYMO'LOGIST. *s.* (from *etymology.*) One who searches out the original of words.

ETYMOLOGICON, is used for a book containing the etymologies of any language. See Etymology.

ETYMOLOGY. (ἐτυμολογια.) That part of grammar which considers, deduces, and explains the origin, reason, and derivation of words, in order to arrive at their first and primary signification. The word is formed of the Greek ἔτυμος, *verus*, true, and λεγω, *dico*, I speak; whence λογια, discourse, &c. and thence Cicero calls the etymology *notatio* and *veriloquium*, though Quintilian chooses rather to call it *originatio*.

In all ages there have been people curious in etymologies: Varro has written on the etymology of the Latin words; and we have a Greek etymologicon, under the name of Nicas.

The etymologies of our English words have been deduced from the Saxon, Welsh, Walloon, Danish, Latin, Greek, &c. by Somner, Camden, Verstegan, Spelman, Casaubon, Skinner, Henshaw, Junius, &c.

Those of the French and Italian words by Menage, Henry Stephens, Tripot, Borel, Caseneuve, Guichard, F. Thomassin, Postel, and Falconet.

We have a Latin etymologicon of Gerard Vossius, another of Martinius, &c. Octavio Ferrari has given a body of etymologies of the Italian tongue, and Bernard d'Aldretta another of the Spanish.

A strict and solicitous inquiry into etymologies is no frivolous and impertinent design, but has considerable uses. Nations, who value themselves on their antiquity, have always looked on the antiquity of their language as one of the best titles they could plead. The etymologists, by seeking the true and original reason of the notions and ideas annexed to each word and expression, may often furnish an argument of antiquity from the vestigia or traces remaining thereof, and from the indices still subsisting in the present use of the words compared with the ancient uses. Add, that etymologies are necessary to the thorough understanding of a language; for, to explain a term precisely, there seems a necessity of recurring to its first imposition, in order to speak justly and satisfactorily thereof. The force and extent of a word is generally better conceived and entered into when a person knows its origin and etymology. It is objected, however, that the art is arbitrary, and built altogether on conjectures and appearances; and the etymologists are charged with deriving their words from what originals they please; but the science is certainly real, and as regular as diverse others, having its proper principles and method. It must be owned, indeed, that it is not easy to return into the ancient British and Gaulish ages; to follow, as it were, by the track, the diverse imperceptible alterations a language has undergone from age to age. A sober etymologist has need of all the lights he can come at, to conduct and bring down words variously disguised in their passage, and remark all the changes that have befallen them; and as those alterations have sometimes been owing to caprice or hazard, it is easy to take a mere imagination or conjecture for a regular analogy; so that it is not strange the public should be prejudiced against a science which seems to stand on so precarious a footing.

As a specimen of the use of etymology, we may remark that the name of Hiddekel (given by Moses to one of the rivers he mentions in his description of Eden), that of Diglath, current in the Levant, and the Tigris of the Europeans, denote one and the same river. Taking away the aspiration of the word Hiddekel, the word Dekel remained, which the Syrians disguised by making Diklat out of it: Josephus, and the Chaldæan paraphrasts, the Arabians, and the Persians, turned it into Diglath; other modern orientals into Degil and Degola; Pliny, or those who informed him, into Diglito; and the Greeks, who gave to all strange words the turn and genius of their own tongue, instead of Diglis, called it Tigris; being induced probably to do so, by the information they had received of the swiftness of this river, which was aptly denoted by the name Tigris. See Plin. l. vi. c. 27. Strab. &c.

Etymology denotes also the part of grammar which delivers the inflections of nouns and verbs.

ETYMON. *s.* (*ετυμον.*) Original; primitive word (*Peacham*).

EU, a seaport of France, in the department of Lower Seine, with a strong castle, and a handsome square. The principal trade is in serges and lace. Lat. 50. 3 N. Lon. 1. 30 E.

To EVA'CATE. *v. a.* (*vaco*, Latin.) To empty out; to throw out (*Harvey*).

EVACUANTS, in medicine, remedies proper to expel or carry off any ill, peccant, or redundant humours in the human body, by the proper outlets or emunctories.

To EVA'CUATE. *v. a.* (*evacuo*, Latin.) 1. To make empty; to clear (*Hooker*). 2. To throw out as noxious, or offensive. 3. To void by the excretory passages (*Arbuthnot*). 4. To make void; to nullify (*South*). 5. To quit; to withdraw from out of a place (*Swift*).

EVACUATION. *s.* (from *evacuate.*) 1. Such emissions as leave a vacancy; discharge (*Hale*). 2. Abolition; nullification (*Hooker*). 3. The practice of emptying the body by physic (*Temple*). 4. Discharge of the body by any vent natural or artificial.

To EVA'DE. *v. a.* (*evado*, Latin.) 1. To elude; to escape by artifice or stratagem (*Brown*). 2. To avoid; to decline by subterfuge (*Dryden*). 3. To escape or elude by sophistry (*Stillingfleet*). 4. To escape as imperceptible or unconquerable (*South*).

To Eva'de. *v. n.* 1. To escape; to slip away (*Bacon*). 2. To practise sophistry or evasions (*South*).

EVAGATION. *s.* (*evagor*, Lat.) The act of wandering; excursion; ramble; deviation (*Ray*).

EVAGORAS. The most celebrated of this name is a king of Cyprus who retook Salamis, which had been taken from his father by the Persians. He made war against Artaxerxes, the king of Persia, with the assistance of the Egyptians, Arabians, and Tyrians, and obtained some advantage over the fleet of his enemy. The Persians, however, soon repaired their losses, and Evagoras saw himself defeated by sea and land, and obliged to be tributary to the power of Artaxerxes, and to be stripped of all his dominions except the town of Salamis. He was assassinated soon after this fatal change of fortune, by an eunuch, 374 B.C. He left two sons, Nicocles, who succeeded him, and Protagoras, who afterwards deprived his nephew Evagoras of his possessions, upon account of his oppression. (*C. Nep. Justin.* &c.)

EVANDER, a son of the prophetess Carmente, king of Arcadia. An accidental homicide obliged him to leave his country, and he came to Italy, drove the Aborigines from their ancient possessions, and reigned in that part of the country where Rome was afterwards founded. He gave Æneas assistance against the Rutuli, and distinguished himself by his hospitality. It is said that he first brought the Greek alphabet into Italy, and introduced there the worship of the Greek deities. He was honoured as a god after death, and his subjects raised him an altar on mount Aventine. (*Paus. Liv.* &c.)—2. A philosopher of the second academy, who flourished B.C. 215.

EVANE'SCENT. *a.* (*evanescens*, Latin.)

Vanishing; imperceptible; lessening beyond the perception of the senses (*Wollaston*).

Evanescent or vanishing quantities, are by Newton considered as divisible, and not determinate, but continually diminishing. The term vanishing is, indeed, applied daily to objects during the time of their disappearing, before they are actually out of sight, absolutely signifying no more than going to vanish: and, as these quantities, being of a finite, i. e. a real magnitude, do not vanish instantaneously, with the utmost propriety they may be said to be vanishing all the time they are undergoing the diminution ascribed to them. Hence appears the mistake of Dr. Berkeley, when he asserts that, *Let these increments vanish*, is equivalent to, *Let the increments be nothing*.

EVANGE'LICAL. *a.* (*evangelicus*, Lat.) 1. Agreeable to gospel; consonant to the christian principles revealed in the gospel (*Atterbury*). 2. Contained in the gospel (*Hooker*).

EVA'NGELISM. *s.* (from *evangely*.) The promulgation of the blessed gospel (*Bacon*).

EVANGELISTS, the inspired authors of the gospels. The word is derived from the Greek ευαγγελιον, formed of ευ, *bene*, well, and αγγελος, angel, messenger.

The denomination evangelists was likewise given in the ancient church to such as preached the gospel up and down, without being attached to any particular church, being either commissioned by the apostles to instruct the nations, or, of their own accord, abandoning every worldly attachment, consecrated themselves to the sacred office of preaching the gospel. In which sense some interpreters think it is that St. Philip, who was one of the seven deacons, is called the evangelist, in the twenty-first chapter of the Acts of the Apostles, ver. 8. Again, St. Paul writing to Timothy, Ep. ii. cap. iv. ver. 5, bids him do the work of an evangelist. The same apostle, Eph. iv. 11, ranks the evangelists after the apostles and prophets.

To EVA'NGELIZE. *v. a.* (*evangelizo*, Lat. ευαγγελιζω.) To instruct in the gospel, or doctrine of Jesus (*Milton*).

EVA'NGELY. *s.* (ευαγγελιον.) Good tidings; the message of pardon and salvation; the holy gospel; the gospel of Jesus (*Spenser*).

EVA'NIA, in zoology, a tribe of hymenopterous insects, belonging to the genus sphex; thus denominated by Fabricius in his entomological system.

EVA'NID. *a.* (*evanidus*, Latin.) Faint; weak; evanescent (*Brown*).

To EVA'NISH. *v. n.* (*evanesco*, Latin.) To vanish; to escape from notice or perception.

EVANTES, in antiquity, priestesses of Bacchus.

EVA'PORABLE. *a.* (from *evaporate*.) Easily dissipated in fumes or vapours (*Grew*).

To EVA'PORATE. *v. n.* (*evaporo*, Latin.) To fly away in vapours or fumes; to waste insensibly as a volatile spirit (*Boyle*).

To Eva'porate. *v. a.* 1. To drive away in fumes (*Bentley*). 2. To give vent to; to let out in ebullition or sallies (*Wotton*).

EVAPORA'TION. *s.* (from *evaporate*.) 1. The act of flying away in fumes or vapours; vent; discharge (*Howel*). 2. The act of attenuating matter, so as to make it fume away (*Raleigh*).

Evaporation. (*evaporatio*.) The volatilization of a fluid by means of heat, with access of air, in order to diminish its fluidity, to obtain any fixed salts it may hold in solution, or to inspissate a residuum. In this manner sea water is evaporated, and its salt obtained, and decoctions are made into extracts.

As a part of technical chemistry,* the process of evaporation is of extreme importance, as being essential to an infinite number of chemical processes, both for experiment and manufacture. As the consumption of fuel is an object of first importance in all large evaporations, numerous experiments have been made to ascertain the greatest possible effect of combustibles in evaporating the watry part of saline and other solutions. It seems to be now well ascertained, that more liquid is evaporated by a given portion of fuel when the liquor is kept at the boiling point, than at any inferior temperature; and hence this is the heat generally employed, except a lower temperature is required for particular purposes. Evaporation is greatly increased by the agitation of the air on the surface of the heated fluid; but again, as this has an equal effect in cooling the whole mass, it is a matter of great doubt, whether the additional strength of fire required to counteract this effect will not, in most cases, destroy any economical advantages which may be proposed from this circumstance.

Evaporating vessels are sometimes made of metal, but more generally of earthen-ware or glass. The glass vessels used in this country are segments of spheres, blown thin enough to bear a lamp-heat; and sold in assortments of different sizes, from the capacity of nearly a pint to that of about an ounce. A broken matrass or Florence flask, cut round, will answer the purpose extremely well. The globular shape of all these vessels, however, renders them difficult to heat; but it is not easy to get glass much flatter at bottom, while it retains that uniform thinness which is necessary to make it bear the application of heat.

Very convenient evaporating vessels, nearly flat-bottomed, are made by Messrs. Wedgewoods, and sold in nests, or assortments, the largest of which will hold eight or ten pints. They are sometimes plain, sometimes with a lip in the upper edge, that the contained liquor may be poured out the more easily. They are made either with or without glazing. Even when unglazed, they do not readily imbibe the liquor introduced into them, as their texture is a very dense, hard, biscuit porcelain: though in great length of time saline solutions will make their way through and show themselves in efflorescences on the outside. These evaporating vessels will bear to be heated to boiling, over a clear hot fire, such as that of charcoal or cinders; but they are liable to crack when exposed to jets of flame, or unless heated with some caution at first. No liquor should be evaporated to driness in these vessels, as they generally crack whilst the last portion of fluid is expelled, unless the heat be much lowered.

Evaporation, in natural philosophy, is the conversion of water into vapour, which in consequence of becoming lighter than the atmosphere, is raised considerably above the surface of the earth, and afterwards by a partial condensation forms clouds.

The phenomenon which consists in the passage of a body from the state of liquidity to that of vapour, takes the name of vaporization, when it is solely due to the action of caloric; and that of evaporation, when the air intervenes in its production, by the affinity (as is usually affirmed) which it exercises towards the particles of the vapour.

Though evaporation be generally considered as an effect of the heat and motion of the air, yet M. Gauteron, in the Memoires de l'Acad. des Scienc. an. 1705, shows, that a quite opposite cause may have the same effect, and that fluids lose more of their parts in the severest frost than when the air is moderately warm: thus, in the great frost of the year 1708, he found that the greater the cold, the more considerable the evaporation; and that ice itself lost full as much as the warmer liquors that did not freeze.

There are indeed few subjects of philosophical investigation that have occasioned a greater variety of opinion than the theory of evaporation, or of the ascent of water in such a fluid as air, between 8 and 9 hundred times lighter than itself, to different heights according to the different densities of the air; in which case it must be specifically lighter than the air through which it ascends. The Cartesians account for it by supposing, that by the action of the sun upon the water, small particles of the water are formed into hollow spheres, and filled with the *materia subtilis*, which renders them specifically lighter than the ambient air, so that they are buoyed up by it.

Dr. Nieuwentyt, in his Religious Philosopher, cont. 19, and several others, have alleged, that the sun emits particles of fire which adhere to those of water, and form moleculæ, or small bodies, lighter than an equal bulk of air, which consequently ascend till they come to a height where the air is of the same specific gravity with themselves; and that these particles being separated from the fire with which they are incorporated, coalesce and descend in dew or rain.

Dr. Halley has advanced another hypothesis, which has been more generally received: he imagined, that by the action of the sun on the surface of the water, the aqueous particles are formed into hollow spherules, that are filled with a finer air highly rarefied, so as to become specifically lighter than the external air. Philos. Transac. number 192.

Others have attempted to account for the phenomena of evaporation on another principle, viz. that of solution; and shown, from a variety of experiments, that what we call evaporation is nothing more than a gradual solution of water in air, produced and supported by the same means, or by attraction, heat, and motion, by which other solutions are effected. This was the opinion of F. Nollet, of Dr. Hamilton, and of M. Leroic. (See Haüy's Natural Philosophy, vol. 1.) It is, however, liable to some very strong objections, as will be seen further on.

Dr. Halley furnishes us with some experiments of the quantity or measure of the evaporation of water. The result is contained in the following articles:

1. That water salted to about the same degree as salt-water, and exposed to a heat equal to that of a summer's day, did, from a circular surface of about eight inches diameter, evaporate at the rate of six ounces in twenty-four hours. Whence, by a calculus, he finds that the thickness of the pellicle or skin of water, evaporated in two hours, was the fifty-third part of an inch; but, for a round number, he supposes it only a sixtieth part; and argues thence, that if water as warm as the air in summer evaporates the thickness of one sixtieth part of an inch in two hours from its whole surface; in twelve hours it will evaporate the tenth of an inch: which quantity, he observes, will be found abundantly sufficient to furnish all the rains, springs, dews, &c. By this experiment, every ten square inches of surface of the water yield in vapour *per diem* a cubic inch of water: and each square foot, half a wine pint; every space of four feet square, a gallon; a mile square, 6914 tuns; and a square degree, of sixty-nine English miles, will evaporate thirty-three millions of tuns a-day; and the whole Mediterranean, computed to contain 160 square degrees, at least 5280 millions of tuns each day. Philos. Trans. number 189, or Abridg. vol. 2, p. 108.—2. A surface of eight square inches, evaporated purely by the natural warmth of the weather, without either wind or sun, in the course of a whole year, 16292 grains of water, or sixty-four cubic inches; consequently, the depth of water thus evaporated in one year amounts to eight inches. But this being too little to answer the experiments of the French, who found that it rained nineteen inches of water in one year at Paris; or those of Mr. Townley, who found the annual quantity of rain in Lancashire above forty inches; he concludes, that the sun and wind contribute more to evaporation than any internal heat or agitation of the water. In effect, Dr. Halley fixes the annual evaporation of London at 48 inches; and Dr. Dobson states the same for Liverpool at $36\frac{3}{4}$ inches. Philos. Trans. vol. 67, p. 252.

3. The effect of the wind is very considerable, on a double account; for the same observations show a very odd quality in the vapours of water, viz. that of adhering and hanging to the surface that exhaled them, which they clothe as it were with a fleece of vapourous air; which once investing the vapour, it afterwards rises in much less quantity. Whence, the quantity of water lost in twenty-four hours, when the air is very still, was very small, in proportion to what went off when there was a strong gale of wind abroad to dissipate the fleece, and make room for the emission of vapour; and this, even though the experiment was made in a place as close from the wind as could be contrived. Add, that this fleece of water, hanging to the surface of waters in still weather, is the occasion of very strange appearances, by the refraction of the vapours differing from and exceeding that of common air: whence every thing appears raised, as houses like steeples, ships as on land above the water, the land raised, and as it were lifted from the sea, &c.

4. The same experiments show that the evaporation in May, June, July, and August, which are nearly equal, are about three times as great as those in the months of November, December, January, and February. Philosophical Transactions, number 212.

Dr. Brownrigg, in his Art of making common salt, p. 189, fixes the evaporation of some parts of

England at 73·8 inches during the months of May, June, July, and August; and the evaporation of the whole year at more than 140 inches. But the evaporation of the four summer months at Liverpool, on a medium of four years, was found to be only 18·88 inches. Also Dr. Hales calculates the greatest annual evaporation from the surface of the earth in England at 6·66 inches; and therefore the annual evaporation from a surface of water, is to the annual evaporation from the surface of the earth at Liverpool, nearly as 6 to 1. Philos. Trans. vol. 67, ubi supra.

As a very considerable proportion of the earth's surface is covered with water, and as this water is constantly evaporating and mixing with the atmosphere in the state of vapour, a precise determination of the rate of evaporation must be of very great importance in meteorology. Accordingly, many experiments have been made to determine the point by different philosophers. No person has succeeded so completely as Mr. Dalton: but many curious particulars had been previously ascertained by the labours of Richman, Lambert, Watson, Saussure, De Luc, Kirwan, and others. From these we learn that, 1. the evaporation is confined entirely to the surface of the water: hence it is in all cases proportional to the surface of the water exposed to the atmosphere. Much more vapour of course rises in maritime countries, or those interspersed with lakes, than in inland countries. 2. Much more vapour rises during hot weather than during cold: hence the quantity evaporated depends in some measure upon temperature. The precise law has been happily discovered by Mr. Dalton, who says, in general, the quantity evaporated from a given surface of water per minute at any temperature, is to the quantity evaporated from the same surface at 212°, as the force of vapour at the first temperature is to the force of vapour at 212°. Hence, in order to discover the quantity which will be lost by evaporation from water of a given temperature, we have only to ascertain the force of vapour at that temperature. Hence, we see that the presence of atmospheric air obstructs the evaporation of water; but this evaporation is overcome in proportion to the force of the vapour. Mr. Dalton ascribes this obstruction to the *vis inertiæ* of air. 3. The quantity of vapour which rises from water, even when the temperature is the same, varies according to circumstances. It is least of all in calm weather, greater when a breeze blows, and greatest of all with a strong wind. Mr. Dalton has given a table that shews the quantity of vapour raised from a circular surface of six inches in diameter in atmospheric temperatures. The first column expresses the temperature; the second the corresponding force of vapour; the other three columns give the number of grains of water that would be evaporated from a surface of six inches in diameter in the respective temperatures, on the supposition of there being previously no aqueous vapour in the atmosphere. These columns present the extremes, and the mean of evaporation likely to be noticed, or nearly such; for the first is calculated upon the supposition of 35 grains loss per minute, from the vessel of 3¼ inches in diameter; the se- 45; and the third 55 grains per minute.

Temperature.	Force of vapour in inches.	Evaporating force in grains.		
212°	30	120	154	189
20°	.129	.52	.67	.82
21	.134	.54	.69	.85
22	.139	.56	.71	.88
23	.144	.58	.73	.91
24	.150	.60	.77	.94
25	.156	.62	.79	.97
26	.162	.65	.82	1.02
27	.168	.67	.86	1.05
28	.174	.70	.90	1.10
29	.180	.72	.93	1.13
30	.186	.74	.95	1.17
31	.193	.77	.99	1.21
32	.200	.80	1.03	1.26
33	.207	.83	1.07	1.30
34	.214	.86	1.11	1.35
35	.221	.89	1.14	1.39
36	.229	.92	1.18	1.45
37	.237	.95	1.22	1.49
38	.245	.98	1.26	1.54
39	.254	1.02	1.31	1.60
40	.263	1.05	1.35	1.65
41	.273	1.09	1.40	1.71
42	.283	1.13	1.45	1.78
43	.294	1.18	1.51	1.85
44	.305	1.22	1.57	1.92
45	.316	1.26	1.62	1.99
46	.327	1.31	1.68	2.06
47	.339	1.36	1.75	2.13
48	.351	1.40	1.80	2.20
49	.363	1.45	1.86	2.28
50	.375	1.50	1.92	2.36
51	.388	1.55	1.99	2.44
52	.401	1.60	2.06	2.51
53	.415	1.66	2.13	2.61
54	.429	1.71	2.20	2.69
55	.443	1.77	2.28	2.78
56	.458	1.83	2.35	2.88
57	.474	1.90	2.43	2.98
58	.490	1.96	2.52	3.08
59	.507	2.03	2.61	3.19
60	.524	2.10	2.70	3.30
61	.542	2.17	2.79	3.41
62	.560	2.24	2.88	3.52
63	.578	2.31	2.97	3.63
64	.597	2.39	3.07	3.76
65	.616	2.46	3.16	3.87
66	.635	2.54	3.27	3.99
67	.655	2.62	3.37	4.12
68	.676	2.70	3.47	4.24
69	.698	2.79	3.59	4.38
70	.721	2.88	3.70	4.53
71	.745	2.98	3.83	4.68
72	.770	3.08	3.96	4.84
73	.796	3.18	4.09	5.00
74	.823	3.29	4.23	5.17
75	.851	3.40	4.37	5.34
76	.880	3.52	4.52	5.53
77	.910	3.65	4.68	5.72
78	.940	3.76	4.83	5.91
79	.971	3.88	4.99	6.10
80	1.00	4.00	5.14	6.29
81	1.04	4.16	5.35	6.54
82	1.07	4.28	5.50	6.73
83	1.10	4.40	5.66	6.91
84	1.14	4.56	5.86	7.17
85	1.17	4.68	6.70	7.46

4. Such is the quantity of vapour which would rise in different circumstances, on the supposition that no vapour existed in the atmosphere. But this is a supposition which can never be admitted, as the atmosphere is in no case totally free from vapour. Now, when we wish to ascertain the rate at which evaporation is going on, we have only to find the force of the vapour already in the atmosphere, and subtract it from the force of vapour at the given temperature; the remainder gives us the actual force of evaporation; from which, by the table, we readily find the rate of evaporation. Thus, suppose we wish to know the rate of evaporation at the temperature 59°. From the table, we see that the force of vapour at 59° is 0.5, or $\frac{1}{60}$ its force at 212°. Suppose we find by trials, that the force of the vapour already existing in the atmosphere is 0.25, or the half of $\frac{1}{60}$. To ascertain the rate of evaporation, we must subtract the 0.25 from 0.5; the remainder 0.25 gives us the force of evaporation required; which is precisely one half of what it would be if no vapour had previously existed in the atmosphere. 5. As the force of the vapour actually in the atmosphere is seldom equal to the force of vapour of the temperature of the atmosphere evaporation, with a few exceptions, may be considered as constantly going on. Various attempts have been made to ascertain the quantity evaporated in the course of a year; but the difficulty of the problem is so great, that we can expect only an approximation towards a solution.

If we believe Col. Williams, the evaporation from the surface of land covered with trees and other vegetables is one-third greater than from the surface of water; but this has not been confirmed by other philosophers. From his experiments it appears, that in Bradford, in New England, the evaporation, during 1772, amounted to 42.65 inches. But, from the way that his experiments were conducted, the amount was probably too great.

From an experiment of Dr. Watson, made on the 2d of June, 1779, after a month's drought, it appears, that the evaporation from a square inch of a grass plot amounted to 1.2 grains in an hour, or 28.8 grains in 24 hours, which is 0.061 of an inch. In another experiment, after there had been no rain for a week, the heat of the earth being 110°, the evaporation was found almost twice as great, or = 0.108 of an inch in the day. The mean of these two experiments is 0.084 inches, amounting for the whole of June to 2.62 inches. If we suppose this to bear the same proportion to the whole year that the evaporation in Dr. Dobson's experiments for June do to the annual evaporation, we shall obtain an annual evaporation, amounting to about 22 inches. This is much smaller than that obtained by Col. Williams. But Dr. Watson's method was not susceptible of precision. He collected the vapour raised on the inside of a drinking-glass; but it was impossible that the glass could condense much more than one half of what did rise, or would have been raised in other circumstances. But then the experiments were made in the hottest part of the day, when much more vapour is raised than during any part of it.

The most exact set of experiments on the evaporation from the earth was made by Mr. Dalton and Mr. Hoyle, during 1796, and the two succeeding years. The method which they adopted was this: Having got a cylindrical vessel of tinned iron, ten inches in diameter, and three feet deep, there were inserted into it two pipes turned downwards for the water to run off into bottles: the one pipe was near the bottom of the vessel, the other was an inch from the top. The vessel was filled up for a few inches with gravel and sand, and all the rest with good fresh soil. It was then put into a hole in the ground, and the space around filled up with earth, except on one side, for the convenience of putting bottles to the two pipes; then some water was poured on to sadden the earth, and as much of it as would was suffered to run through without notice, by which the earth might be considered as saturated with water. For some weeks the soil was kept above the level of the upper pipe, but latterly it was constantly a little below it, which precluded any water running off through it. For the first year the soil at top was bare; but for the two last years it was covered with grass the same as any green field. Things being thus circumstanced, a regular register was kept of the quantity of rain water that ran off from the surface of the earth through the upper pipe (whilst that took place), and also of the quantity of that which sunk down through the three feet of earth, and ran out through the lower pipe. A rain-gauge of the same diameter was kept close by to find the quantity of rain for any corresponding time. The weight of the water which ran through the pipes being subtracted from the water in the rain-gauge, the remainder was considered as the weight of the water evaporated from the earth in the vessel.

From the experiments which were thus conducted, it appears that the quantity of vapour raised annually at Manchester is about 25 inches. If to this we add five inches for the dew with Mr. Dalton, it will make the annual evaporation 30 inches. Now, if we consider the situation of England, and the greater quantity of vapour raised from water, it will not surely be considered as too great an allowance, if we estimate the mean annual evaporation over the whole surface of the globe at 35 inches. Now, 35 inches from every square inch, on the superficies of the globe, make 94,450 cubic miles, equal to the water annually evaporated over the whole globe. Were this prodigious mass of water all to subsist in the atmosphere at once, it would increase its mass by about a twelfth, and raise the barometer nearly three inches: but this never happens; no day passes without rain in some part of the earth; so that part of the evaporated water is constantly precipitated again. Indeed it would be impossible for the whole of the evaporated water to subsist in the atmosphere at once, at least in the state of vapour. *Manchester Memoirs.*

But the grand question returns upon us, how is water taken up and retained in the atmosphere? It cannot be in the state of vapour, it is said, because the pressure is too great: there must, therefore, be a true chemical solution. But when we consider that the surface of water is subject to a pressure equal to 30 inches of mercury, and that besides this pressure, there is a sensible affinity between the particles of water themselves; how does the insensible affinity of the atmosphere for water overcome both these powers? How does vapour, which ascends with an elastic force of only half an inch of mercury, detach itself from water when it has the weight of 30 inches of mercury to oppose its ascent? This difficulty applies nearly the same to all theories of the solution of water in air; and it is therefore of consequence for every one, let him adopt what opinion he may, to remove it. Chemical solution but very ill explains it; for the affinity of air for vapour is always described as weak, and yet it must be sufficient to overcome a pressure so powerful as that of the atmosphere. Mr. Dalton is of opinion, that it is not till the depth of 10 or 12 strata of particles of any liquid, that the pressure upon each vertical column becomes uniform; and that several of the particles in the uppermost stratum are in reality subject to very little pressure. Chem. Philos. p. 193.

Hence it appears, that we have not, as yet, any theory of evaporation which is even plausible.

EVA'SION. *s.* (*evasum*, Latin.) Excuse; subterfuge; sophistry; artifice (*Milton*).

EVA'SIVE. *a.* (from *evade.*) 1. Practising evasion; elusive (*Pope*). 2. Containing an evasion; sophistical.

EVA'SIVELY. *ad.* By evasion; elusively; sophistically.

EVATES, and EUBAGES, orders among the Druids. The former took care of the sacrifices; the latter gave themselves up to contemplation.

EUBŒA, the largest island in the Ægean sea after Crete, now called Negropont. It is separated from the continent of Bœotia by the narrow straits of the Euripus. It is 150 miles long, and 37 broad in its most extensive parts. The principal town was Chalcis, and the whole island in process of time was subjected to the power of the Greeks. (*Plin. Strab.* &c.)—The only remarkable person of this name is one of the three daughters of the river Asterion, who was one of the nurses of Juno.

EUBULIDES. The most remarkable of this name is a philosopher of Miletus, pupil and successor to Euclid. Demosthenes was one of his pupils. He severely attacked the doctrines of Aristotle.

EUCALY'PTUS, in botany, a genus of the class icosandria, order monogynia. Calyx superior, permanent, truncate: covered, before flowering, with an entire deciduous lid or veil; capsule four-celled, opening at top, many-seeded. Fifteen species; some with the lid or veil conic; others hemispheric. All natives of New Holland. They are all trees or shrubs; and afford, on being tapped, a considerable portion of gummose or resinous fluid; not unfrequently employed with success in diarrhœas.

EUCHARIST, the sacrament of the Lord's supper, properly signifies giving thanks. The word in its original Greek, ευχαριστια, literally imports thanksgiving; being formed of ευ, *bene*, well, and χαρις, *gratia*, thanks. This sacrament was instituted by Christ himself, and the participation of it is called communion. The scriptural accounts of the institution of the eucharist, prove clearly that it was a rite designed by God to keep up a continual remembrance of the doctrine of the atonement. See Dr. A. Clarke's learned Discourse on the Eucharist.

EUCHARI'STICAL. *a.* (from *eucharist.*) 1. Containing acts of thanksgiving (*Ray*). 2. Relating to the sacrament of the supper of the Lord.

EUCHITES, or EUCHITÆ, a sect who were first formed into a religious body towards the end of the fourth century, though their doctrine and discipline subsisted in Syria, Egypt, and other eastern countries before the birth of Christ; they were thus called because they prayed without ceasing, imagining that prayer alone was sufficient to save them. Their great foundation were those words of St. Paul, Epist. i. to the Thessalonians, cap. v. ver. 17, *pray without ceasing*. The word is formed of the Greek ευχη, prayer, whence ευχιται, the same with the Latin *precatores*, prayers. They were also called Enthusiasts and Messalians, a term of Hebrew origin, denoting the same as Euchites. The Euchites were a sort of mystics who imagined, according to the oriental notion, that two souls resided in man, the one good, and the other evil; and who were zealous in expelling the evil soul or dæmon, and hastening the return of the good spirit of God, by contemplation, prayer, and singing of hymns. They also embraced the opinions nearly resembling the Manichean doctrine, and which they derived from the tenets of the oriental philosophy.

EUCHOLOGIUM. (ευχολογιον.) A Greek term, signifying literally, a discourse on prayer. The word is formed of ευχη, prayer, and λογος, discourse. The euchologium is properly the Greek ritual, wherein are prescribed the order and manner of every thing relating to the order and administration of their ceremonies, sacraments, ordinations, &c.

EUCLASE. See GEMMA.

EU'CLEA, in botany, a genus of the class diœcia, order dodecandria. Calyx four or five-toothed; corol four or five-parted. Male; stamens from twelve to fifteen. Female; germ superior; styles two; berry two-celled. One species only: a Cape tree, with branching spread; racemes axillary and nodding.

EUCLID, an eminent philosopher of Megara, and the disciple of Socrates. Although he was extremely partial to his master, he differed from him in the manner of teaching; for, instead of instructing his pupils in morals, he confined their attention wholly to the subtleties of logic. Hence his followers became noted wranglers, and were less desirous of discovering truth than puzzling blockheads.

EUCLID, a famous mathematician of Alexandria, who flourished B.C. 300. He immortalized his name by his books on geometry, in which he digested all the propositions of the eminent geometricians who had preceded him, as Thales, Pythagoras, and others. King Ptolemy became one of his pupils, and his school became so famous, that Alexandria continued for ages the great university for mathematicians. The latest edition of his works is that of Gregory, Oxford, folio, 1703. There have been published many editions of his Elements in the course of the last two or three centuries, as by Billingsley, Commandine, De Chales, Barrow, Tacquet, Ozanam, Whiston, Martin, R. Simson, Bonnycastle, Playfair, and Ingram. The last four are generally esteemed the best; though Barrow's is particularly valuable, as it contains the whole fifteen books, and sir H.

Billingsley's (in 1570), is not merely valuable on the same account; but is curious for its great age, and for the elaborate preface of John Dee, dated from his "poore house at Mortlake."

EU'COMIS, in botany, a genus of the class hexandria, order monogynia. Corol inferior, six-parted, permanent, spreading; filaments united at the base into a nectary growing to the bottom of the corol. Five species; all Cape plants.

EU'CRASY. *s.* (ευκρασια.) An agreeable well-proportioned mixture of qualities, whereby the body is in health (*Quincy*).

EUDIOMETER. See EUDIOMETRY.

EUDIOMETRY. (ευδια, purity of air, and μετρον, a scale or measure.) The science of determining the purity of atmospheric air, by measuring the proportion of oxygen (on which its respirable property depends) in a given quantity of it: whence the tests or instruments employed in this science are denominated eudiometers.

When the composition of the atmosphere became first known to philosophers, it was taken for granted that the proportion of its oxygen varies at different times and in different places; and that upon this variation depends the purity or noxious qualities of air. Hence it became an object of great importance to get possession of a method to determine readily the quantity of oxygen in a given portion of air. Accordingly various methods were proposed, all of them depending upon the property which many bodies possess of absorbing the oxygen of the air without acting upon its azote.

These bodies were mixed with a certain known quantity of atmospheric air in graduated glass vessels, inverted over water, and the proportion of oxygen was determined by the diminution of bulk. The eudiometers thus proposed by different chemists, may be reduced to four; that of nitrous gass, of sulphurets, of hydrogen gass, and of phosphorus.

Eudiometer of Nitrous Gass.

1. The first eudiometer was devised in consequence of Dr. Priestley's discovery, that when nitrous gas is mixed with air over water, the bulk of the mixture diminishes rapidly, in consequence of the combination of the gass with the oxygen of the air, and the absorption of the nitric acid thus formed by the water. When nitrous gass is mixed with azotic gass, no diminution at all takes place. When it is mixed with oxygen gass in proper proportions, the absorption is complete. Hence it is evident, that in all cases of a mixture of these two gasses, the diminution will be proportional to the quantity of the oxygen. Of course it will indicate the proportion of oxygen in air; it will indicate the different quantities of oxygen which they contain, provided the component parts of air be susceptible of variation. Dr. Priestley's method was to mix together equal bulks of air and nitrous gass in a low jar, and then to transfer the mixture into a narrow graduated glass tube about three feet long, in order to measure the diminution of bulk. He expressed this diminution by the number of hundred parts remaining. Thus suppose he had mixed together equal parts of nitrous gass and air, the sum total of this mixture was 200 (or 2·00): suppose the residuum when measured in the graduated tube to amount to 104 (or 1.04), and of course that ninety-six parts of the whole had disappeared, he denoted the purity of the air thus tried by 104. A more convenient instrument was invented by Dr. Falconer of Bath; and Fontana greatly improved this method of measuring the purity of air. A description of his eudiometer was published by Ingenhousz in the first volume of his experiments; but it was Mr. Cavendish who first brought this eudiometer to such a state of precision, as to be enabled to ascertain correctly the constituents of air. His method was to put 125 measures of nitrous gass into a glass vessel, and to let up into it very slowly 100 measures of the air to be examined, agitating the vessel containing the nitrous gass during the whole time. The diminution of bulk when the process was conducted in this way was almost uniform. The greatest was 110, the least 106 8; the mean 108·2. The variation he found to depend, not upon the air examined, but upon the state of the water in which the experiment was made. If the experiment was reversed, by letting up the nitrous gass to common air, he used 100 measures of each, and the diminution in that case was only 90 measures.

This constancy in the diminution of the bulk of all the different specimens of common air examined, induced Mr. Cavendish to conclude, that the proportion between the oxygen and azote in common air does not vary. To find the absolute quantity of oxygen in air, he mixed together oxygen gass and azote in various proportions, and at last found that a mixture of 10 measures of the purest oxygen which he could procure with 38 measures of azot, was just as much diminished by nitrous gass as the same bulk of common air. Hence he concluded that air is composed of 10 parts by bulk of oxygen, and 38 of azot, which gives us for its composition per cent

79.16	azot.
20.84	oxygen.
100.00	

Or very nearly 21 per cent. of oxygen gass.

Other philosophers, who did not pay that rigid attention to precision which characterises all Mr. Cavendish's experiments, obtained variable results from the nitrous gass eudiometer. Most of the circumstances which occasion the variation, were pointed out by Cavendish; but they seem to have escaped the observation of succeeding chemists. Humboldt's attempt to render the eudiometer of Fontana accurate did not succeed. But Mr. Dalton has lately explained the anomalies in a very luminous manner. According to this philosopher, oxygen gass and nitrous gass are capable of uniting in two proportions: 21 measures of oxygen gass, or with twice 36-72 measures. Both of these compounds are soluble in water. If the tube be wide, a considerable portion of nitrous gass comes at once in contact with the oxygen. Hence the latter gass combines with a maximum of nitrous, especially if agitation be employed. In a narrow tube the oxygen combines with the minimum of nitrous gass, provided no agitation be employed, and the residue be poured soon into another vessel. When intermediate proportions are used, the absorption will be intermediate. Mr. Dalton recommends a narrow tube; the nitrous gass is to be only in the proportion requisite to form the minimum combination; no agitation is to be employed; and when the diminution is completed, the gass must be transferred to another tube. To 100 measures of air, add about 36 of nitrous gass; note the diminution of bulk, and multiply it by $\frac{7}{19}$; the product gives the bulk of oxygen in the air examined. In order to get rid of the anomalies which had perplexed former experimenters, Mr. Davy proposed to employ the nitrous gass in a different state. He caused sulphat or muriat of iron to absorb this gass to saturation, and employed the dark brown liquid thus obtained to deprive air of its oxygen. A small graduated glass tube, filled with the air to be examined, is plunged into the nitrous solution, and moved a little backwards and forwards. The whole of the oxygen is absorbed in a few minutes. The state of greatest absorption ought to be marked, as the mixture afterwards emits a little gass, which would alter the result. By means of this, Mr. Davy examined the air at Bristol, and found it always to contain 0·21 of oxygen. Air sent to Dr. Beddoes from the coast of Guinea gave exactly the same result.

Eudiometer of Sulphurets.

2. For the second kind of eudiometer we are indebted to Scheele. It is merely a graduated glass vessel, containing a given quantity of air, exposed to newly prepared liquid alkaline or earthy sulphurets, or to a mixture of iron filings and sulphur, formed into a paste with water. These substances absorb the whole of the oxygen of the air, which converts a portion of the sulphur into an acid. The oxygen contained in the air thus examined is judged by the diminution of bulk which the air has undergone. This method is not only exceedingly simple, but it requires very little address, and yet is susceptible of as great accuracy as any other whatever. The only objection to which it is liable is its slowness; for when the quantity of air operated on is considerable, several days elapse before the diminution has reached its maximum.

But this objection has been completely obviated by Mr. de Marti, who has brought Scheele's eudiometer to a state of perfection. He found that a mixture of iron filings and sulphur does not answer well, because it emits a small quantity of hydrogen gass, evolved by the action of the sulphuric acid formed upon the iron; but the hydrogureted sulphurets, formed by boiling together sulphur and liquid potash or lime-water, answered the purpose perfectly. These substances, indeed, when newly prepared, have the property of absorbing a small portion of azotic gass; but they lose this property when saturated with that gass, which is easily effected by agitating them for a few minutes with a small portion of atmospheric air. His apparatus is merely a glass tube, ten inches long, and rather less than half an inch in diameter, open at one end, and hermetically sealed at the other. The close end is divided into 100 equal parts, having an interval of one line between each division. The use of this tube is to measure the portion of air to be employed in the experiment. The tube is filled with water; and by allowing the water to run out gradually while the tube is inverted, and the open end kept shut with the finger, the graduated part is exactly filled with air. These hundred parts of air are introduced into a glass bottle filled with liquid sulphuret of lime, previously saturated with azotic gas, and capable of holding from two to four times the bulk of the air introduced. The bottle is then to be corked with a ground glass stopper, and agitated for five minutes. After this the cork is to be withdrawn, while the mouth of the phial is under water; and for the greater security, it may be corked and agitated again. After this, the air is to be again transferred to the graduated glass tube, in order to ascertain the diminution of its bulk.

Air examined by this process suffers precisely the same diminution in whatever circumstances the experiments are made: no variation is observed whether the wind be high or low, or from what quarter soever it blows; whether the air tried be moist or dry, hot or cold; whether the barometer be high or low. Neither the season of the year, nor the situation of the place, its vicinity to the sea, to marshes, or to mountains, make any difference. Mr. De Marti found the diminution always between 0·21 and 0·23.

Eudiometer of Hydrogen Gass.

3. The third kind of eudiometer was proposed by Volta. The substance employed by that philosopher to separate the oxygen from the air was hydrogen gass. His method was to mix given proportions of the air to be examined and hydrogen gass in a graduated glass tube; to fire the mixture by an electric spark; and to judge of the purity of the air by the bulk of the residuum. This method has been lately examined by Gay Lussac and Humboldt. They have found it susceptible of great precision. It is one of the simplest and most elegant methods of estimating the proportion of oxygen in air. When 100 measures of hydrogen are mixed with 200, or any greater bulk of oxygen up to 900 measures, the diminution of bulk after detonation is always 146 measures. The same diminution is obtained if the hydrogen be increased up to a certain quantity. The result of their trials is, that 100 measures of oxygen gass require 200 of hydrogen for complete combustion, which coincides very

well with the trials previously made in this country. Hence the method of using this eudiometer is very simple: mix together equal bulks of the air to be examined, and of hydrogen gass, ascertain the diminution of bulk after combustion, divide it by three; the quotient represents the number of measures of oxygen in the air. A great number of trials, in different seasons of the year, of mixtures of 200 measures of air and as much hydrogen, gave almost uniformly a diminution of bulk amounting to 126 measures. Now the third of 126 is 42, the quantity of oxygen in 200 measures of air. Hence 100 parts of air, according to these trials, contain 21 of oxygen.

Eudiometer of Phosphorus.

4. In the fourth kind of eudiometer, the abstraction of the oxygen of air is accomplished by means of phosphorus. This eudiometer was first proposed by Achard. It was considerably improved by Reboul, and by Seguin and Lavoisier; but Berthollet has lately brought it to a state of perfection.

Instead of the rapid combustion of phosphorus, this last philosopher has substituted its spontaneous combustion, which absorbs the oxygen of air completely; and when the quantity of air operated on is small, the process is over in a short time. The whole apparatus consists in a narrow graduated tube of glass, containing the air to be examined, into which is introduced a cylinder of phosphorus fixed upon a glass rod, while the tube stands inverted over water. The phosphorus should be so long as to traverse nearly the whole of the air. Immediately white vapours rise from the phosphorus and fill the tube. These continue till the whole of the oxygen combines with phosphorus. They consist of phosphoric acid, which falls by its weight to the bottom of the vessel, and is absorbed by the water. The residuum is merely the azotic gass of the air, holding a portion of phosphorus in solution. Berthollet has ascertained, that by this foreign body its bulk is increased one-fortieth part. Consequently the bulk of the residuum, diminished by one-forty, gives us the bulk of the azotic gass of the air examined; which bulk subtracted from the original mass of air gives us the proportion of oxygen gass contained in it. All the different experiments which have been made by means of this eudiometer agree precisely in their result, and indicate that the proportions of the ingredients of air are always the same; namely, about 0·21 parts of oxygen gass, and 0 79 of azotic gass. Berthollet found these proportions in Egypt and France, and we have found them constantly in London, in all the different seasons of the year.

Thus it appears that whatever method is employed to abstract oxygen from air, the result is uniform, provided the experiment be precisely made. They all indicate that common air consists very nearly of 21 parts of oxygen, and 79 of azote. Scheele and Lavoissier found 27 per cent. of oxygen, but their methods were not susceptible of precision. Air, then, does not vary in its composition; the proportion between its constituents is constant in all places and in all heights. Gay Lussac examined air brought from the height of more than 21,000 feet above Paris, and found it precisely the same as the air at the earth's surface.

Eudiometers.

The instruments employed in eudiometrical observations, as we have already observed, are denominated eudiometers; and consist of jars graduated in some particular manner for the purpose of experiment. The jar employed for this purpose should be wider at the bottom than at the top, that it may stand securely: and in order to graduate it, weigh in the jar successive portions of distilled water, corresponding with the divisions of the cubic inch intended to be marked, and scratch the levels by the file or a diamond, and carry the lines of division nearly round the whole circumference of the jar; as otherwise some deception may easily arise in the use of it, unless the surfaces of the top and bottom of the jar should be exactly parallel to each other; for when graduated by successive quantities of water, it is obvious that the jar must stand on its closed end, and the contrary when graduated by portions of air.

But this may be regarded as merely a graduated, and not, strictly speaking, an eudiometrical jar. Eudiometrical vessels, however, have been contrived, in which the substance intended to analyze the contained air, by absorbing a portion, may be conveniently applied to it.

Of these, the first we shall notice is Dr. Hope's. It consists of two parts, the lower of which is a short thick bottle, with an upper and a side opening (the latter closed by a glass stopple); and the higher part is a graduated tube closed at top, and accurately fitting into the lower bottle by grinding. To use it, take off the tube, and fill it quite full with the gass to be examined; and fill also the bottle with the eudiometrical liquid (sulphuret of lime, for example), and without shaking it, sink it in water. Then immersing the open end of the tube in the same vessel, bring it over the bottle and thrust it in. The bottle and tube may then be taken out and well shaken, that the liquor may thoroughly come in contact with the contained gass; and the bottle from time to time re-immersed under water, and the side stopple a little loosened, that the water may rush in, to supply the partial vacuum produced by the absorption. This will, indeed, somewhat dilute the eudiometrical liquor, but not so as to prevent it from acting. When no more absorption takes place, the process is finished (which at longest only requires a few minutes), and the absorption is noted at once by the graduated scale; or if the tube be not graduated, the residual gass may be transferred to another that is.

Another eudiometer has been invented by Mr. Davy, but rather for the analysis of atmospheric air than of any other aërial compound. It consists simply of a portion of a glass barometer tube, bent into two legs of equal lengths, both of which are furnished with glass stopples, and one of them graduated. It is thus used: the tube is of course filled with the air of the place which it occupies; or for greater certainty, it may be first entirely filled with water, and then inverted; by which means the adjoining air will enter as the water falls out. Then holding it with the bend lowermost, and both the stopples out, drop down through the plain or ungraduated side a little water, till it reaches the beginning of the graduation, and close the graduated side with the stopple, so that the air may occupy exactly the whole of the graduated space. Then pour down the plain side upon the water the eudiometrical liquor (sulphat of iron holding nitrous gas in solution) till this side is quite full, and close the stopple also. The whole cavity will then contain a known portion of air in contact with the proper liquor, which, by agitation, will absorb all the oxygen of the air in a few seconds, and by loosening the stopple of the plain side under water, the residuary gass on the other side will shrink to its proper volume, and may be estimated immediately.

EUDOSIA, ATHENIA (before her conversion to Christianity), a celebrated lady, the daughter of Leontius, philosopher of Athens; who gave her such a learned educacation, that at his death he left her only a small legacy, saying she was capable of making her own fortune; but pleading at Athens without success against her two brothers, for a share in her father's estate, she carried her cause personally by appeal to Constantinople; recommended herself to Pulcheria, the sister of the emperor Theodosius the younger; embraced Christianity, was baptized by the name of Eudosia, and soon after married to the emperor. Their union lasted a considerable time: but a difference at last taking place, on account of the emperor's jealousy excited by Chrysapius the eunuch, she retired to Jerusalem, where she spent many years in building and adorning churches and relieving the poor. Dupin says, that she did not return thence till after the emperor's death; but Cave tells us, that she was reconciled to him, returned to Constantinople, and continued with him till his death; after which she went again to Palestine, where she spent the remainder of her life in pious works. She died in the year 460, according to Dupin; or 459, according to Cave: the latter observes, that on her deathbed she took a solemn oath, by which she declared herself entirely free from any stains of unchastity. She was the author of a paraphrase on the eight first books of the Old Testament in heroic verse; and of a great number of poems, which are lost.

EUDOXIA, a daughter of Theodosius the younger, who married the emperor Maximus, and invited Genseric the Vandal over into Italy.

EUDOXIANS, a party or sect in the fourth century, so denominated from their leader Eudoxius, patriarch of Antioch and Constantinople, a great defender of the Arian doctrine. The Eudoxians adhered to the errors of the Arians, &c. maintaining, that the son was created out of nothing, &c.

EUDOXUS, of Cnidus, a city of Caria in Asia Minor, flourished about 370 years before Christ. He learned geometry from Archytas, and afterwards travelled into Egypt to learn astronomy and other sciences. There he and Plato studied together, as Laertius informs us, for the space of 13 years; and afterwards came to Athens, fraught with all sorts of knowledge, which they had imbibed from the mouths of the priests. Here Eudoxus opened a school; which he supported with so much glory and renown, that even Plato, though his friend, is said to have envied him. Eudoxus composed Elements of Geometry, from whence Euclid literally borrowed, as mentioned by Proclus. Cicero calls Eudoxus the greatest astronomer that had ever lived: and Petronius says, he spent the latter part of his life upon the top of a very high mountain, that he might contemplate the stars and the heavens with more convenience and less interruption: and we learn from Strabo, that there were some remains of his observatory at Cnidus, to be seen even in his time. He died in the 53d year of his age. (*Hutton*).

EVE, the mother of all mankind, who, being deluded by the serpent, occasioned the fall, and all its dismal consequences.

EVE. E'VEN. *s.* (æꝼen, Saxon.) *1.* The close of the day (*May*). 2. The vigil or fast to be observed before a holiday (*Duppa*).

EVECTION, is used by some astronomers for the libration of the moon; being an inequality in her motion, by which, at or near the quadratures, she is not in a line drawn through the centre of the earth to the sun, as she is at the sizygies, or conjunction and opposition, but makes a small angle with that line.

The term evection is used by some astronomers to denote that equation of the moon's motion, which is proportional to the sine of double the distance of the moon from the sun, diminished by the moon's anomaly.

The general and constant effect of the evection is to diminish the equation of the centre in the sizygies, and to augment it in the quadratures. If this diminution and augmentation were always the same, the evection would depend solely on the angular distance of the moon from the sun; but its absolute value varies likewise with the distance of the moon from the perigee of its orbit. The period of the evection differs very little from a periodical revolution of the moon, it is 27·178533 days.

Representing the moon by the sign ☾, and as the sun by ☉, the evection may be expressed by

1.°34018 sin. (2 dist. ☾ ☉ — mean anom. ☾). From this it will be easy to trace the successive variations of this inequality: for, it will only be requisite to consider the divers values which its argument may assume. If, for example, we would know the case where it attains its maximum, we have only to enquire when the angle 2 dist. ☾ ☉ — mean anom. ☾, becomes equal to 90° or to 270°; because then the sine of that angle being equal to unity taken positively or negatively, the evection will become ±1·°34018=1° 20′ 25″. The first value will obtain in the quadrature, for instance, when the mean anomaly will be equal to 90°; for we shall then have 2 dist. ☾ ☉ =180°, and 2 dist. ☾ ☉ — mean anom. ☾ =180°—90°. On the contrary, the evection will disappear, when the argument is either 0° or 180°, which happens, for example, in the sizygies, when the moon will be in its perige or apoge; because in that case the distance of the moon from the sun is either 0° or 180°, and it is the same with the mean anomaly. But by the various combinations and mutations of the two angles which form the argument of the evection, the greatest and the least values occur again, according to the values of that argument in several other points of the orbit. In general, in the conjunctions the evection will have a contrary sign to the equation of the centre; for its argument then becomes — mean anom. ☾, which will in that case give a *negative* sign if the anomaly is less than 180°, and a *positive* sign if it be greater; but in the former case the equation of the centre is additive, in the latter it is *subtractive*.

It will be the same at the oppositions, as we may easily assure ourselves; since we see that in general in the sizygies the evection is subtractive from the equation of the centre; while, on the contrary, it becomes additive in the quadratures. Thus the early observers, who only determined the elements of the lunar theory by means of eclipses, and solely with the view of predicting those phænomena, found the equation of the centre too small by all the quantities of the evection in the sizygies.

We may easily find the period of the evection from the variations of the angle on which it depends: it is merely necessary to compute the changes that angle undergoes in a given time, and thence to infer by a simple proportion the number of days required to produce a variation of 363°. This period we have stated near the commencement of the present article.

EVELYN (John), an ingenious writer of the last century. He was born at Wotton, in Surrey, in 1620, and educated at Baliol college, Oxford. In 1644 he went on his travels, and improved himself greatly in the knowledge of antiquities and the arts. About 1650 he married a daughter of sir Robert Brown, the English ambassador at Paris, and thereby became possessed of Sayes Court, a seat in the county of Kent, whither he retired, and composed several books, political and philosophical. He was not, however, so absorbed in study as to neglect public affairs, for on the death of Richard Cromwell he laboured zealously in bringing about the restoration. On the king's return he was honoured with particular marks of his attention; and at the establishment of the royal society he became one of the first members. In 1662 appeared his Sculptura, or the History and Art of Chalcography and Engraving in Copper, with an ample enumeration of the most renowned masters and their works; to which is annexed, a new manner of engraving, or mezzotinto, communicated by his royal highness prince Rupert to the author of this treatise, 8vo. In 1664 Mr. Evelyn was appointed one of the commissioners to take care of the sick and wounded; and the same year came out his great work, entitled, Sylva, or a Discourse of Forest Trees, folio, which work has gone through several editions. At his entreaty it was that lord Henry Howard presented the university of Oxford with the Arundelian marbles, for which that learned body returned Mr. Evelyn their thanks. He was appointed one of the commissioners for rebuilding St. Paul's, and paid considerable attention to that great work. In 1669 he was honoured with the degree of LL.D. by the university of Oxford, and about the same time was appointed one of the commissioners of the new board of trade. At the accession of James II. he was made one of the commissioners for executing the office of lord privy seal, and after the revolution he was appointed treasurer of Greenwich hospital. In 1697 appeared his Numismata, or Discourse of Medals, in folio. This ingenious and indefatigable man died in the 86th year of his age, in 1706, and was buried with his ancestors at Wotton. He wrote a great number of books besides those above mentioned.

E'VEN. *a.* (eꝼen, Saxon.) 1. Level; not rugged; not unequal (*Newton*). 2. Uniform; equal to itself (*Prior*). 3. Level with; parallel to (*Exodus*). 4. Not having inclination any way (*Shakspeare*). 5. Not having any part higher or lower than the other (*Davies*). 6. Equal on both sides; fair (*South*). 7. Without any thing owed, either good or ill; out of debt (*Shakspeare*). 8. Calm; not subject to elevation or depression; not uncertain (*Pope*). 9. Capable to be divided into equal parts; not odd (*Taylor*).

EVEN NUMBER, EVENLY EVEN NUMBER, and EVENLY ODD NUMBER. See NUMBER.

To E'VEN. *v. a.* (from the noun.) 1. To make even. 2. To make out of debt (*Shakspeare*). 3. To level; to make level (*Raleigh*).

To E'VEN. *v. n.* To be equal to (*Carew*).

E'VEN. *ad.* (often contracted to *ev'n.*) 1. Verily (*Spenser*). 2. Notwithstanding (*Dryden*). 3. Likewise; not only so, but also (*Atterbury*). 4. So much as (*Swift*).

EVENHA'NDED. *a.* (*even* and *handed.*) Impartial; equitable (*Shakspeare*).

E'VENING. *s.* (æꝼꞇn, Saxon.) The close of the day; the beginning of night (*Watts*).

E'VENLY. (from *even.*) 1. Equally; uniformly (*Bentley*). 2. Levelly; without asperities (*Wotton*). 3. Without inclination to either side; horizontally (*Brerewood*). 4. Impartially; without favour or enmity (*Bac.*).

E'VENNESS. *s.* (from *even.*) 1. State of being even. 2. Uniformity; regularity (*Grew*). 3. Equality of surface; levelness. 4. Freedom from inclination to either side; horizontal position (*Hooker*). 5. Impartiality; equal respect. 6. Calmness; freedom from perturbation; equanimity (*Atterbury*).

E'VENSONG. *s.* (*even* and *song.*) 1. The form of worship used in the evening (*Taylor*). 2. The evening; the close of the day (*Dryden*).

E'VENTIDE. *s.* (*even* and *tide.*) The time of evening (*Spenser*).

EVE'NT. *s.* (*eventus*, Latin.) 1. An accident; any thing that happens, good or bad (*Ecclus*). 2. The consequence of an action; the conclusion; the upshot (*Dryden*).

To EVE'NTERATE. *v. a.* (*eventero*, Lat.) To rip up; to open the belly (*Brown*).

EVE'NTFUL. *a.* (*event* and *full.*) Full of incidents (*Shakspeare*).

To EVE'NTILATE. *v. n.* (*eventilo*, Lat.) 1. To winnow; to sift out. 2. To examine; to discuss

EVE'NTUAL. *a.* (from *event.*) Happening in consequence of any thing; consequential.

EVE'NTUALLY. *ad.* In the event; in the last result; in the consequence (*Boyle*).

EVENUS, a river of Ætolia, flowing into the Ionian sea. It receives its name from Evenus, son of Mars and Sterope, who being unable to overcome Idas, who had promised him his daughter Marpessa in marriage, if he surpassed him in running, grew so desperate that he threw himself into the river, which afterwards bore his name. (*Ovid*).

E'VER. *ad.* (æꝼꞃe, Saxon.) 1. At any time (*Tillotson*). 2. At all times; always; without end (*Hooker*). 3. *For ever.* Eternally; to perpetuity (*Phil.*). 4. At one time (*Spenser*). 5. In any degree (*Hall*). 6. A word of enforcement, or aggravation. *As soon as* ever *he had done it* (*Shakspeare*). 7. Ever *a.* Any (*Shakspeare*). 8. It is often contracted into *e'er.* 9. It is much used in composition in the sense of *always*: as *evergreen*, green throughout the year; *everduring*, enduring without end.

EVERBU'BBLING. *a.* Boiling up with perpetual murmurs (*Crashaw*).

EVE'RBURNING. *a.* Unextinguished (*Milton*).

EVE'RDURING. *a.* Eternal; enduring without end (*Raleigh*).

EVERGETES, a surname, signifying *benefactor*, given to Philip of Macedonia, and commonly to the kings of Syria and Pontus.

EVERGRE'EN. *a.* Verdant throughout the year (*Milton*).

E'vergreen. *s.* A plant that retains its verdure through all the seasons (*Evelyn*).

Evergreen oak, in botany. See Lubercus.

Evergreen thorn, in botany. See Mespilus.

EVERHO'NOURED. *a.* Always held in honour or esteem (*Pope*).

EVERLA'STING. *a.* Enduring without end; perpetual; immortal; eternal (*Hammond*).

Everlasting, in botany. See Gnaphalium.

Everlasting flower. See Gomphrœna.

Everlasting pea. See Lathyrus.

Everla'sting. *s.* Eternity (*Psalms*).

EVERLA'STINGLY. *ad.* Eternally; without end (*Shakspeare*).

EVERLA'STINGNESS. *s.* Eternity; perpetuity; an indefinite duration (*Donne*).

EVERLI'VING. *a.* Living without end; immortal; eternal; incessant (*Newton*).

EVERMO'RE. *ad.* Always; eternally (*Tillotson*).

EVERO'PEN. *a.* Never closed; not at any time shut (*Taylor*).

EVERPLE'ASING. *a.* Delighting at all times; never ceasing to give pleasure (*Sidney*).

To EVE'RSE. *v. a.* (*eversus*, Latin.) To overthrow; to subvert: not used (*Glanville*).

EVERSHOT, a town in Dorsetshire, with a market on Fridays. Lat. 50. 52 N. Lon. 2. 55 W.

To EVE'RT. *v. a.* (*everto*, Latin.) To destroy; to overthrow (*Ayliffe*).

EVERWA'TCHFUL. *a.* Always vigilant (*Pope*).

E'VERY. *a.* (æꝼeꞃ ealc, Saxon.) 1. Each one of all (*Hammond*). 2. Every-where. In all places (*Hooker*).

EVERYO'UNG. *a.* Not subject to old age; undecaying (*Pope*).

E'VESDROPPER. *s.* (*eaves* and *dropper.*) Some mean fellow that skulks about a house in the night to listen (*Dryden*).

EVESHAM, a borough in Worcestershire, with a market on Mondays. It is seated on a hill which rises with a gradual ascent from the Avon, over which is a stone bridge. It was formerly famous for an abbey: it now has 3 churches. Lat. 52 4 N. Lon. 1. 45 W.

Evesham (The Vale of), in Worcestershire, on the banks of the Avon, which flows along the S.E. part of the county in its course to meet the Severn. It is celebrated for its fertility and beauty; and, beside the usual objects of agriculture, great quantities of garden-stuff are here grown, and sent to the towns around to a considerable distance. In this vale, Simon de Montfort, earl of Leicester, was defeated and slain, in 1265, the very year in which, by virtue of his usurped authority, that admirable part of our constitution, the house of commons, is said to have first received its existence.

To EVE'STIGATE. *v. a.* (*evestigo*, Lat.) To search out.

EUGENE (Francis), prince of Savoy, descended from Carignan, one of the three branches of the house of Savoy, and son of Eugene Maurice, general of the Swiss and Grisons, governor of Champagne, and earl of Soissons, was born in 1663. Louis XIV. to whom he became afterwards so formidable an enemy, thought him so unpromising a youth, that he refused him preferment both in the church and the state, thinking him too much addicted to pleasure to be useful in either. Prince Eugene, in disgust, quitted France; and, retiring to Vienna, devoted himself to the imperial service. The war between the emperor and the Turks afforded the first opportunity of exerting his military talents; and every campaign proved a new step in his advancement to the highest offices in the army. He gave the Turks a memorable defeat at Zenta; commanded the German forces in Italy, where he foiled marshal Villeroy in every engagement, and at length took him prisoner. Our limits do not allow a detail of his campaigns; but prince Eugene distinguished himself greatly, when the emperor and queen Anne united against the exorbitant power of Louis XIV. He died at Vienna in the year 1736; and was as remarkable for his modesty and liberality, as for his abilities in the field and the cabinet.

EUGENIA. Yamboo. Clove-tree. In botany, a genus of the class icosandria, order monogynia. Calyx four-cleft, superior; petals four; berry one-celled, many-seeded. Twenty-nine species; natives of the East or West Indies, or South America. Generally trees rising to between twenty and thirty feet; bearing a plum-shaped fruit, inclosing a single nut.

The two following species are particularly worth noticing:

1. E. jambos. Malabar plum. Leaves very entire, lanceolate; peduncles terminal, about four-flowered. The fruit is eaten both fresh, and preserved in sugar. A conserve is made of the flowers for medicinal purposes, and most commonly used as an astringent.

2. E. caryophyllata. Aromatic clove-tree. Leaves very entire, oblong, rather acute; panicles axillary and terminal; peduncles trichotomous; calyx repand; fruit elliptic. This has formerly been regarded as a distinct genus of the polyandrian, monogynian class and order, and described under the generic name caryophyllus. A minuter examination, however, has sufficiently proved that the present is its true situation. It is a native of the Moluccas, and especially of Amboyna, where it is principally cultivated. In its bark it resembles the olive, and is of the usual size of the laurel. No verdure grows beneath it. It bears a great number of branches, at the extremities of which are produced vast quantities of flowers that are at first white, then green, and at last pretty red and hard, in which state they constitute our officinal cloves. They contain a prodigious quantity of oil, and have an oily feeling to the pressure of the finger.

EUGH. *s.* A tree; the yew (*Dryden*).

To **EVI'CT.** *v. a.* (*evinco*, Latin.) 1. To dispossess of by a judicial discourse. 2. To take away by a sentence of law (*K. James*). 3. To prove; to evince (*Cheyne*).

EVI'CTION. *s.* (from *evict*.) 1. Disposition or deprivation by a definitive sentence of a court of judicature (*Bacon*). 2. Proof; evidence (*L'Estrange*).

E'VIDENCE. *s.* (French.) 1. The state of being evident; clearness; notoriety; indubitable certainty. 2. Testimony; proof (*Tillotson*). 3. Witness; one that gives evidence (*Bentley*).

To E'VIDENCE. *v. a.* (from the noun.) 1. To prove; to evince (*Tillotson*). 2. To show; to make discovery of (*Milton*).

EVIDENCE, in law, is the testimony adduced before a court or magistrate of competent jurisdiction, by which such court or magistrate are enabled to ascertain any fact which may be litigated between the parties.

This may be of two kinds, viz. written or verbal: the former by deeds, bonds, or other written documents; the latter by witnesses examined viva voce.

Evidence may be further divided into absolute and presumptive; the former is direct, in positive or absolute affirmance or denial of any particular fact; the latter collateral, and from the conduct of the parties, affords an inference that such a particular fact did or did not occur.

The party making an affirmative allegation which is denied by his adversary, is in general required to prove it: unless, indeed, a man is charged with not doing an act, which by law he is required to do; for here a different rule must necessarily prevail. And the rule is, that the evidence must be applied to the particular fact in dispute; and therefore, no evidence not relating to the issue, or in some manner connected with it, can be received; nor can the character of either party, unless put in issue by the very proceeding itself, be called in question; for the cause is to be decided on its own circumstances, and not to be prejudiced by any matter foreign to it.

It is an established principle, that the best evidence the nature of the case will admit shall be produced; for if it appears that better evidence might have been brought forward, the very circumstance of its being withheld furnishes a suspicion that it would have prejudiced the party in whose power it is, had he produced it. Thus, if a written contract is in the custody of the party, no verbal testimony can be received of its contents.

The law never gives credit to the bare assertion of any one, however high his rank or pure his morals; but requires (except in particular cases with respect to quakers) the sanction of an oath, and the personal attendance of the party in court that he may be examined and cross-examined by the different parties; and therefore, in cases depending on parole or verbal evidence, the testimony of persons who are themselves conversant with the facts they relate must be produced; the law paying no regard, except under special circumstances, to any hearsay evidence. Thus in some cases, the memorandum in writing made at the time, by a person since deceased, in the ordinary way of his business, and which is corroborated by other circumstances, will be admitted as evidence of the fact.

Witnesses are summoned by writ of subpœna, to attend on penalty of 100*l.* to the king, and 10*l.* to the party, by statute 5 Eliz. c. 9. besides damages sustained by their non-attendance. All witnesses of all religions, who believe in a future state of rewards and punishments, are received, but not persons infamous in law by their crimes, nor persons directly interested in the matter in issue; and no counsel or attorney shall be compelled to disclose the secrets intrusted to him by his client, but he may give evidence of facts which he knew by other means than for the purpose of the cause. One witness is sufficient to any fact, except in high treason, when by statutes 1 Edw. VI. c. 12, and 5 and 6 Edw. VI. c. 11, two are required, but that is only in treasons of conspiracy against the state, and not treasons relating to the coin, &c. The oath of the witness is to speak the truth; the whole truth, and nothing but the truth, and all evidence is to be given in open court.

The general rules of evidence are, 1. The best evidence must be given that the nature of the thing is capable of. 2. No person interested in the question can be a witness; but to this there are exceptions, as first, in criminal prosecutions; secondly, for general usage, for convenience of trade, as a servant to prove the delivery of goods, though it tends to clear himself of neglect. 3. Where the witness acquires the interest by his own act, after the party who calls him has a right to his evidence. The third rule is, that hearsay of a matter of fact is no evidence; but of matter of reputation, such as a custom, it is in some sort evidence. 4. Where a general character is the matter in issue, particular facts may be received in evidence, but not where it occurs incidentally. 5. In every issue the affirmative is to be proved. 6. No evidence need be given of what is agreed, or not denied upon the pleadings.

In criminal cases the same rules prevail, but evidence of the confessions of the party should be received with caution, and are rejected when obtained through promises or threats. Presumptive evidence should be admitted with caution, and two excellent rules are given by sir Matthew Hale, that no one should be convicted of stealings goods of a person actually unknown, unless there is a proof of a felony actually committed; and none tried for murder, until the murdered body be found.

As no one can be witness for himself, it follows of course, that husband and wife, whose interest the law has united, are incompetent to give evidence on behalf of each other, or of any person whose interest is the same; and the law, considering the policy of marriage, also prevents them giving evidence against each other: for it would be hard that a wife, who could not be a witness for her husband, should be a witness against him; such a rule would occasion implacable divisions and quarrels between them. In like manner, as the law respects the private peace of men, it considers the confidential communications made for the purpose of defence in a court of justice. By permitting a party to intrust his cause in the hands of a third person, it establishes a confidence and trust between the client and person so employed.

Barristers and attorneys, to whom facts are related professionally during a cause, or in contemplation of it, are neither obliged nor permitted to disclose the facts so divulged during the pendency of that cause, nor at any future time; and if a foreigner, in communication with his attorney, has recourse to an interpreter, he is equally bound to secrecy.

Lord Ellenborough, upon the authority of lord chief justice Tully, has recently laid down a very important doctrine, viz. that no witness shall be bound to answer any question which tends to degrade himself, or to shew him to be infamous.

E'VIDENT. *a.* (French.) Plain; apparent; notorious (*Brown*).

E'VIDENTLY. *ad.* Apparently; certainly; undeniably (*Prior*).

E'VIL. *a.* (ẏꝼel, Saxon.) 1. Having bad qualities of any kind; not good (*Psalms*). 2. Wicked; bad; corrupt (*Matthew*). 3. Unhappy; miserable; calamitous (*Proverbs*). 4. Mischievous; destructive (*Genesis*).

Evil. *s.* (generally contracted to *ill.*) 1. Wickedness; a crime (*Shakspeare*). 2. Injury; mischief (*Proverbs*) 3. Malignity; corruption (*Ecclesiasticus*). 4. Misfortune; calamity (*Job*). 5. Malady; disease (*Shakspeare*).

Evil (Malum), in ethics, a privation or absence of some proper or necessary good, or of some measure or degree thereof.

Evil is either natural or moral; between which there is this relation, that moral evil produces natural.

Evil (Moral), is defined a deviation from right reason; a discernment of right from wrong, being given us as a guide to our actions; or it is the disagreement between the actions of a moral agent and the rule of those actions, whencesoever it is derived and howsoever made known; and no action can be morally evil unless the agent be properly such, intelligent and free, and capable of distinguishing, choosing, and acting for himself. This the philosophers call inhonestum, and turpe, as staining the image of God, and sullying our original beauty, likewise malumculpæ.

Evil (Natural), is a want of something necessary to the bene esse, or perfection of a thing, or to its answering all its purposes: such are defects of the body, blindness, lameness, hunger, diseases, death. This species is denominated triste, injucundum, noxium, and malum pœnæ.

Again, evil is either absolute, as envy, impiety, &c. or relative, as meat, which in itself being good, may be evil to a man on account of some disease; as wine to a feverish person, &c.

On the subject of this article there is a question which has perplexed mankind in all ages. If the world is conducted by a wise and benevolent Being, how came evil to be introduced into it? The ancient Persians resolved the question, by asserting the existence of two gods, Oromasdes the author of good, and Arimanius the author of evil. From them the Christian heretics called Manichees borrowed their doctrine of two opposite coeternal principles. Both the Platonists and Stoics ascribed the origin of evil to the perverseness or imperfection of matter, which they thought the Deity could not alter; and Pythagoras imagined a state of pre-existence, in which the souls of men had committed offences, for which they are here suffering the punishment. But these hypotheses are some of them impious, and all unsatisfactory.

Taking the expression in its most extensive sense, the evils to which the human race are exposed may be reduced to pain, uneasiness, disappointment of appetites, and death; of which not one could have been wholly prevented without occasioning greater evils, inconsistent with the perfect goodness of the Creator. As long as we have solid bodies capable of motion, supported by food, subject to the influence of the atmosphere, and divisible, they must necessarily be liable to dissolution or death: but if a man could suffer death, or have his limbs broken, without feeling pain, the human race had been long ago extinct. A fever is a state of the body in which the fluids are in great disorder, we should have no inducement to pay the proper attention to our state, and should certainly die unawares, without suspecting ourselves to be in danger; whereas, under the present administration of divine Providence, the pain and sickness of the disease compel us to have recourse to the remedies proper for restoring us to soundness and to health. Of the uneasinesses to which we are liable, and which are not the effect of immediate pain, the greatest has been sometimes said to arise from the apprehension of death, which constantly stares us in the face, and frequently embitters all our pleasures even in the hour of perfect health. But this dread of death is implanted in our breasts for the very best of purposes. Had we no horror at the apprehension of death, we should be apt, whenever any misfortune befel us, to quit this world rashly, and rush unprepared into the presence of our judge: but the horror which attends our reflections on our own dissolution, arising not from any apprehensions of the pain of dying, but from our anxiety concerning our future state of existence, tends strongly to make us act, while we are here, in such a manner as to ensure our happiness hereafter. Add to this, that the fear of death is the greatest support of human laws. We every day see persons breaking through all the regulations of society and good life, notwithstanding they know death to be the certain consequence, and fell all the horrors of it that are natural to man; and, therefore, were death divested of these horrors, how insignificant would capital punishments be as guardians of the laws, and how insecure would individuals be in civil society?

With regard to the unavoidable misfortunes and anxieties of our present state, so far from being truly hurtful in themselves, they are proofs of divine beneficence. When we see men displeased with their situation, when we hear them complain of the difficulties, the miseries, and the cares of life, of the hardships which they have undergone, and the labours which still lie before them; instead of accounting them unfortunate, we ought to regard them as active beings, placed in the only situation that is fit for the improvement of their nature. That discontent, those restless wishes to improve their condition, are so many sure indications that their faculties will not languish. They who are in the least degree accustomed to observe the human character know well the influence which pleasure and repose have in enfeebling every manly principle, and how capable they are of attaching us even to a sordid and dishonourable existence.

Happy indeed it is for the human race, that the number of those men is small whom Providence has placed in situations in which personal activity is unnecessary. By far the greater number are compelled to exert themselves, to mix and to contend with their equals, in the race of fortune and of honour. It is thus that our powers are called forth, and that our nature reaches its highest perfection. It is even perhaps a general truth, that they who have struggled with the greatest variety of hardships, as they always acquire the highest energy of character, so if they have retained their integrity, and have not sunk entirely in the contest, seldom fail to spend their remaining days respectable and happy, superior to passion, and secured from folly by the possession of a wisdom dearly earned.

But the benefits of physical evils have been set in a still stronger light by a great master of moral wisdom, who was himself subject to many of these evils. That man is a moral agent sent into this world to acquire habits of virtue and piety, to fit him for a better state, is a truth to which no consistent theist will for a moment refuse his assent. But almost all the moral good which is left among us is the apparent effect of physical evil, as Dr. Johnson thus shews:

"Goodness is divided by divines into soberness, righteousness, and godliness. Let it be examined how each of these duties would be practised if there were no physical evil to enforce it.

"Sobriety or temperance is nothing but the forbearance of pleasure; and if pleasure was not followed by pain, who would forbear it? We see every hour those in whom the desire of present indulgence overpowers all sense of past and all foresight of future misery. In a remission of the gout, the drunkard returns to his wine and the glutton to his feast; and if neither disease nor poverty were felt or dreaded, every one would sink down in idle sensuality, without any care of others, or of himself. To eat, and drink, and lie down to sleep, would be the whole business of mankind.

"Righteousness, or the system of social duty, may be subdivided into justice and charity. Of justice, one of the heathen sages has shewn, with great acuteness, that it was impressed upon mankind only by the inconveniencies which injustice had produced. 'In the first ages (says he) men acted without any rule but the impulse of desire; they practised injustice upon others, and suffered it from others in their turn: but in time it was discovered, that the pain of suffering wrong was greater than the pleasure of doing it; and mankind, by a general compact, submitted to the restraint of laws, and resigned the pleasure to escape the pain.'

"Of charity it is superfluous to observe that it could have no place, if there were no want; for of a virtue which could not be practised, the omission could not be culpable. Evil is not only the occasional but the efficient cause of charity; we are incited to the relief of misery by the consciousness that we have the same nature with the sufferer; that we are in danger of the same distresses, and may sometime implore the same assistance.

"Godliness or piety is elevation of the mind towards the Supreme Being, and extension of the thoughts to another life. The other life is future, and the Supreme Being is invisible. None would have recourse to an invisible power, but that all other subjects had eluded their hopes. None would fix their attention upon the future but that they are discontented with the present. If the senses were feasted with perpetual pleasure, they would always keep the mind in subjection. Reason has no authority over us but by its power to warn us against evil.

"In childhood, while our minds are yet unoccupied, religion is impressed upon them; and the first years of almost all who have been well educated are passed in a regular discharge of the duties of piety: but as we advance forward into the crowds of life, innumerable delights solicit our inclinations, and innumerable cares distract our attention. The time of youth is passed in noisy frolics; manhood is led on from hope to hope, and from project to project; the dissoluteness of pleasure, the inebriation of success, the ardour of expectation, and the vehemence of competition, chain down the mind alike to the present scene: nor is it remembered how soon this mist of trifles must be scattered, and the bubbles that float upon the rivulet of life be lost for ever in the gulph of eternity. To this consideration scarce any man is awakened but by some pressing and resistless evil; the death of those from whom he derived his pleasure, or to whom he destined his possessions, some disease which shews him the vanity of all external acquisitions, or the gloom of age which intercepts his prospects of long enjoyment, forces him to fix his hopes upon another state; and when he has contended with the tempests of life till his strength fails him, he flies at last to the shelter of religion.

"That misery does not make all virtuous, experience too certainly informs us; but it is no less certain, that of what virtue there is, misery produces far the greater part. Physical evil may be therefore endured with patience, since it is the cause of moral good; and patience itself is one virtue by which we are prepared for that state in which evil shall be no more." (*Johnson's Idler*, No. 89.)

The calamities and the hardships of our present state, then, are so far from being real evils, of which providence ought to be accused, that in every point of view in which we can consider them, they afford the surest proofs of the wisdom of its administration, and of its goodness to man.

The most serious difficulty lies in accounting for the permission of moral evil or guilt, in a system governed by infinite benevolence and wisdom. Those who in a consistent manner hold the doctrine of the absolute necessity of human actions in its full extent, and acknowledge all its consequences, find it easy to elude this difficulty. They very fairly deny the existence of any such thing as moral evil in the abstract; and assert that what we call a crime, is nothing more than an action which we always regard with a painful sensation; that these apparent evils endure only for a time; and that all will at last terminate in the perfection and happiness of every intelligent being.

Upon the system of liberty, the shortest answer seems to be this: that some things are absolutely impossible, not from any weakness in the Deity, but because they infer absurdity or contradiction. Thus it is impossible for twice two to be any thing else than four; and thus it is impossible for Omnipotence itself to confer self-approbation upon an intelligent being who has never deserved it; that is to say, it is impossible for a man of sense to be pleased with himself for having done a certain action, while he himself is conscious that he never did that action. But self-approbation constitutes the highest, the most unmingled, and permanent felicity of which our nature is capable. It is not in the power of Omnipotence itself, then, to bestow the highest and most permanent felicity of our nature; it must be earned and deserved before it can be obtained. In the same manner good desert, virtue, or merit, cannot be conferred; they must be acquired. To enable us to acquire these, we must be exposed to difficulties, and must suffer in a certain degree. If these difficulties had no influence upon our conduct and feelings, if they exposed us to no real danger, no fabric of merit and of self-approbation could be reared upon them. All that the Supreme Being could do for us, was to confer such an original constitution and character as would enable us to do well if we should exert our utmost powers. The universe is not ruled by favour, but by justice. Complete felicity must be purchased. Guilt is an abuse of our freedom, a doing ill where we could have done well, and is entirely the work of man. Heaven could not avoid permitting its existence, and exposing us to danger; for temptation is necessary to virtue, and virtue is the perfection of our nature, our glory, and our happiness.

The permission of moral evil has been so ably accounted for by Simplicius, a Pagan writer, and therefore not biassed by any partiality to the Jewish or Christian Scriptures, that we cannot deny ourselves the pleasure of laying his reasoning before our readers: He asks, "Whether God may be called the author of sin, because he permits the soul to use her liberty?" and answers the question thus:

"He who says that God should not permit

the exercise of its freedom to the soul, must affirm one of these two things; either that the soul, though by nature capable of indifferently choosing good or evil, should yet be constantly prevented from choosing evil; or else that it should have been made of such a nature as to have no power of choosing evil.

"The former assertion (continues he) is irrational and absurd; for what kind of liberty would that be in which there should be no freedom of choice? and what choice could there be, if the mind were constantly restrained to one side of every alternative? With respect to the second assertion, it is to be observed (says he), that no evil is in itself desirable, or can be chosen as evil. But if this power of determining itself either way in any given case must be taken from the soul, it must either be as something not good, or as some great evil. But whoever saith so, does not consider how many things there are which, though accounted good and desirable, are yet never put in competition with this freedom of will: for without it we should be on a level with the brutes; and there is no person who would rather be a brute than a man. If God then shews his goodness in giving to inferior beings such perfections as are far below this, is it incongruous to the divine nature and goodness to give man a self-determining power over his actions, and to permit him the free exercise of that power? Had God, to prevent man's sin, taken away the liberty of his will, he would likewise have destroyed the foundation of all virtue, and the very nature of man; for there could be no virtue were there not a possibility of vice; and man's nature, had it continued rational, would have been divine, because impeccable. Therefore (continues he), though we attribute to God, as its author, this self-determining power, which is so necessary in the order of the universe; we have no reason to attribute to him that evil which comes by the abuse of liberty: for God doth not cause that aversion from good which is in the soul when it sins; he only gave to the soul such a power as might turn itself to evil, out of which he produces much good, which, without such a power, could not have been produced by Omnipotence itself." So consonant to the doctrine of our scriptures is the reasoning of this opponent of the writings of Moses! *Fas est et ab hoste doceri.*

E'VIL. *ad.* (commonly contracted to *ill.*) 1. Not well in whatever respects (*Shakspeare*). 2. Not well; not virtuously (*John*). 3. Not well; not happily (*Deuteronomy*). 4. Injuriously; not kindly (*Deuteronomy*). 5. It is often used in composition to give a bad meaning to a word.

EVILAFFE'CTED. *a.* Not kind; not disposed to kindness (*Acts*).

EVILDO'ER. *s.* Malefactor; one that commits crimes (*Peter*).

EVILFA'VOURED. *a* Ill countenanced; having no good aspect (*Bacon*).

EVILFA'VOUREDNESS. *s.* (from *evil-favoured.*) Deformity (*Deuteronomy*).

E'VILLY. *ad.* (from *evil.*) Not well (*Sh.*).

EVILMI'NDED. *a.* Malicious; mischievous; malignant; wicked (*Dryden*).

E'VILNESS. *s.* (from *evil.*) Contrariety to goodness; badness of whatever kind (*Hale*).

EVILSPEA'KING. *s.* Slander; defamation; calumny; censoriousness (*Peter*).

EVILWI'SHING. *a.* Wishing bad to; having no good-will (*Sidney*).

EVILWO'RKER. *s.* One who does wickedness (*Philippians*).

To EVI'NCE. *v. a.* (*evinco*, Latin.) To prove; to show; to manifest (*Atterbury*).

EVI'NCIBLE. *a.* (from *evince.*) Capable of proof; demonstrable (*Hale*).

EVI'NCIBLY. *a.* (from *evincible.*) In such a manner as to force conviction.

To EVIRATE. *v. a.* (*eviratus*, Latin.) To deprive of manhood; to emasculate.

To EVI'SCERATE. *v. a.* (*eviscero*, Latin.) To embowel; to draw; to deprive of the entrails; to search within the entrails.

E'VITABLE. *a.* (*evitabilis*, Latin.) Avoidable; that may be escaped or shunned (*Hook.*).

To E'VITATE. *v. a.* (*evito*, Latin.) To avoid; to shun; to escape (*Shakspeare*).

EVITA'TION. *s.* (from *evitate.*) The act of avoiding (*Bacon*).

EVITE'RNAL. *a.* (*æviturnus*, Latin.) Eternal in a limited sense; of duration not infinitely but indefinitely long.

EVITER'NITY. *s.* (*æviturnitas*, low Lat.) Duration not infinitely but indefinitely long.

EULER (Leonard), was born at Basil, on the 14th of April, 1707; he was the son of Paul Euler and of Margaret Brucker (of an illustrious family in letters), and spent the first year of his life at the village of Richen, of which place his father was minister. Being intended for the church, his father, who had himself studied under James Bernoulli, taught him mathematics, with a view to their proving the ground-work of his other studies, and in hopes that they would turn out a noble and useful secondary occupation; but they were destined to become a principal one; and Euler, assisted by John Bernoulli, soon declared his intention of devoting his life to the pursuit: an intention, which the wise father did not thwart, and which the sensible son did not so adhere to, as not to connect with it a more than common improvement in every other kind of useful learning, insomuch that in his latter days men were wont to wonder how, with such a superiority in one branch, he could have been so near eminence in all the rest. On the foundation of the Academy of Sciences at St. Petersburg, in 1723, by Catherine I. the two younger Bernoullis had gone thither, promising, when they set out, to endeavour to procure Euler a place in it: they accordingly wrote to him soon after, to apply his mathematics to physiology: he did so, and studied physic under the best physicians at Basil, but at the same time, i. e. 1727, published a dissertation on the nature and propagation of sound: and an answer to the question on the masting of ships, which the Academy of Sciences at Paris judged worthy of the accessit. Soon after this, he was called to St. Petersburg, and declared adjutant to the mathematical class in the academy, a class in which, from the circumstances of the times (Newton, Leibnitz, and so many other immortals having just ceased to live) no easy laurels were to be gathered. Euler now perfected the calculus integralis, which before was in its infancy: he was the inventor of a new kind of calculus, that of sines; he simplified analytical operations, and, aided by these powerful helpmates, and the astonishing facility with which he knew how to subdue expressions the most intractable, threw a new light on all the branches of the mathematics. But at Catherine's death the academy was threatened with extinction, by men who knew not the connection which arts and sciences have with the happiness of a people. Euler was offered and accepted a lieutenancy on board one of the empress's ships, with the promise of speedy advancement. Luckily things changed, and our doctor captain again found his own element, and was named Professor of Natural Philosophy in 1733, in the room of his friend John Bernoulli. The great number of memoirs which Euler produced prior to this period is astonishing; but what he did in 1735 is almost incredible. An important calculation was to be made, without loss of time; the other academicians had demanded some months to do it. Euler asked three days; in three days he did it; but the fatigue threw him into a fever, and the fever left him, but not without the loss of an eye; an admonition which would have made ordinary men more sparing of the other: he continued his exertions, however, with such ardour as, at length, produced total blindness. In 1736 he published an excellent treatise on the science of motion. In 1740 he shared the prize offered by the Paris Academy for the best theory of the Tides, with Maclaurin and D. Bernoulli, a very extraordinary triumvirate. In 1741, Euler received some very advantageous propositions from Frederic the second (who had just ascended the Prussian throne) to go and assist him in forming an academy of sciences out of the wrecks of the Royal Society founded by Leibnitz. With these offers the tottering state of the St. Petersburg academy under the regency made it necessary for our philosopher to comply. He accordingly illuminated the last volume of the Melanges de Berlin with five essays, which are, perhaps, the best things in it, and contributed largely to the academical volumes, the first of which was published in 1744. No part of his multifarious labours is, perhaps, a more wonderful proof of the extensiveness and facility of his genius, than what he executed at Berlin, at a time when he contrived that the Petersburg acts should not suffer from the loss of him. In 1744, Euler published a complete treatise of isoperimetrical curves. In 1766 he returned to Petersburg, and soon after became completely blind. About this period he dictated to his servant his Elements of Algebra, which have excited wonder and applause. About the year 1770 he entered with great ardour into the consideration of the theory of the moon; in the course of which he performed the most immense calculations, and went through them with astonishing dexterity. Some time after this the famous oculist Wentzell, by couching the cataract, restored sight to our author; but the joy produced by this operation was of short duration. Some instances of negligence on the part of his surgeons, and his own impatience to use an organ, whose cure was not completely finished, deprived him a second time and for ever of his sight: a relapse which was also accompanied with tormenting pain. With the assistance of his sons, however, and of Messrs. Krafft and Lexell, he continued his labours: neither the infirmities of old age, nor the loss of his sight, could quench his genius. He had engaged to furnish the academy of Petersburg with as many memoirs as would be sufficient to complete its acts for 20 years after his death. In the space of seven years he transmitted to the academy above 70 memoirs, and above 200 more, left behind him, were revised and completed by a friend. Such of these memoirs as were of ancient date were separated from the rest, and form a collection that was published in the year 1783, under the title of Analytical Works. The general knowledge and taste of our author was more extensive than could well be expected in one who had pursued, with such unremitting ardour, mathematics and astronomy as his favourite studies. He had made a very considerable progress in medical, botanical, musical, and chemical science. What was still more extraordinary, he was an excellent scholar, and possessed in a high degree what is generally called erudition. He had attentively read the most eminent writers of ancient Rome; the civil and literary history of all ages and all nations was familiar to him; and foreigners, who were only acquainted with his works, were astonished to find in the conversation of a man, whose long life seemed solely occupied in mathematical and physical researches and discoveries, such an extensive acquaintance with the most interesting branches of literature. In this respect, no doubt, he was much indebted to a very uncommon memory, which seemed to retain every idea that was conveyed to it, either from reading or from meditation. He could repeat the Æneid of Virgil, from the beginning to the end, without hesitation, and indicate the first and last line in every page of the edition he used. He invented the clavichord.

Several attacks of a vertigo, in the beginning of September 1783, which did not prevent his computing the motions of the aërostatic globes, were however the forerunners of his mild passage out of this life. While he was amusing himself at tea with one of his grandchildren, he was struck with an apoplexy, which terminated his illustrious career at 76 years of age.

Possessing a mind of such wonderful comprehension, and dispositions so admirably formed to virtue and happiness, Euler found no difficulty in being a Christian. The advocates for the truth of revealed religion, therefore, may add to the bright catalogue of believers which already claims a Bacon, a Newton, a Boyle, a Locke, and a Hale, the illustrious name of Euler. For his learned and grateful pupil, M. Fuss, thus sums up his character: "His piety was rational and sincere: his devotion was fervent: he was fully persuaded of the truth of christianity; felt its importance to the dignity and happiness of human nature; and looked upon its detractors and opposers as the most pernicious enemies of man."

The catalogue of Euler's works has been printed in 50 pages, 14 of which contain his MS. works. Of his numerous performances none have yet been translated into English, but the Theory of the Construction and Properties of Vessels, the Elements of Algebra, and the Letters to a German Princess. We hope our countrymen will soon import more of the rich productions of Euler's highly cultivated, comprehensive, and penetrating mind.

EULOGY. (from ευ, *bene*, well, and λεγω, *dico*, I say, or speak.) In church history, a name by which the Greeks call the panis benedictus, or bread over which a blessing is pronounced, and which is distributed to those who are unqualified to communicate. The name eulogiæ was anciently given to the consecrated pieces of bread, which the bishops and priests sent to each other, for the keeping up a friendly correspondence: those presents likewise which were made out of respect or obligation, were called eulogiæ. St. Paulinus, bishop of Nola, about the end of the sixth century, having sent five eulogiæ, at one time, to Romanian, says, "I send you five pieces of bread, the ammunition of the warfare of Jesus Christ, under whose standard we fight."

EULOGY means likewise an encomium on any person, on account of some virtue or good quality. See ELOGY.

EUMARIDES, an elegant kind of shoes, worn by both sexes, among the ancients.

EUMENES, a Greek officer in the army of Alexander, son of a charioteer. He was the most worthy of all the officers of Alexander to succeed after the death of his master. He conquered Paphlagonia, and Cappadocia, of which he obtained the government, till the power and jealousy of Antigonus obliged him to retire. He joined his forces to those of Perdiccas, and defeated Craterus and Neoptolemus. Neoptolemus perished by the hands of Eumenes. Eumenes fought against Antipater and conquered him, and after the death of Perdiccas, his ally, his arms were directed against Antigonus, by whom he was conquered, chiefly through the treacherous conduct of his officers, who betrayed him into the hands of Antigonus at Nora, a fortified place in Cappadocia, whither he had retired after the last fatal battle. He was put to death by order of Antigonus, B.C. 315. Antigonus, however, honoured his remains with a splendid funeral, and conveyed his ashes to his wife and family in Cappadocia. (*Plut. Diod.* &c.) This name was common also to two kings of Pergamus, in alliance with the Romans, both remarkable for their love of learning. The second of the name greatly enriched the famous library of Pergamus, which had been founded by his predecessors in imitation of the Alexandrian collection of the Ptolemies. (*Polyb.* &c.)

EUMENIDES, a name given to the Furies in the ancient mythology. They sprang from the drops of blood which flowed from the wound which Cœlus received from his son Saturn. According to others they were daughters of the earth, and conceived from the blood of Saturn. Some make them daughters of Acheron and Night, or Pluto and Proserpine. According to the more received opinions, they were three in number, Tisiphone, Megara, and Alecto, to which some add Nemesis. They were supposed to be the ministers of the vengeance of the gods, and were generally represented with a grim aspect, bloody garment, and serpents wreathing round their heads instead of hair. They held a burning torch in one hand, and a whip of scorpions in the other, and were always attended by terror, rage, paleness, and death.

EUMENIDIA, annual festivals in honour of the Eumenides, called by the Athenians σεμναι θεαι, venerable goddesses.

EUMOLPIDÆ, the priests of Ceres at the celebration of her festivals of Elensis. They were descended from Eumolpus, a king of Thrace, who was made priest of Ceres by Erechtheus king of Athens. The priesthood which enjoined perpetual celibacy, remained in the family of Eumolpus for 1200 years.

EUNAPIUS, a writer and physician of the 4th century. He wrote a book of the Lives of the Philosophers and Sophists, in which he speaks rancorously of christianity. He also composed the History of the Cæsars, which is lost, but the substance of it may be seen in Zosimus.

EUNOMIANS, in church history, christians in the fourth century. They were a branch of Arians, and took their name from Eunomius, bishop of Cyzicus, who was instructed by Ætius in the points which were then controverted in the church, after having at first followed the profession of arms. Eunomius so well answered the designs of his master, and declaimed so vehemently against the divinity of the Word, that the people had recourse to the authority of the prince, and had him banished; but the Arians obtained his recal, and elected him bishop of Cyzicus. The manners and doctrines of the Eunomians were the same with those of the Arians.

EUNUCH. (Ευνουχος.) A term applied in the general to all who have not the faculty of generating, either through imbecility or frigidity; but more particularly to such as have been castrated, or have lost some of the parts necessary for that purpose. The word is formed of ευνην εχει, q. d. *lecti curam habet*, guardian, or keeper of the bed. In England, France, &c. eunuchs are never made but on occasion of some disease which renders such an operation necessary; but in Italy they make eunuchs for the sake of preserving the voice;

and in the east they make eunuchs to be guards or attendants on their women.

EU'NUCHATE. *v. a.* To make an eunuch.

EVOCATI, among the Romans, soldiers, who having served their time in the army, went afterwards volunteers at the request of some favourite general.

EVOCATION. (*Evocatio.*) Among the Romans, a religious ceremony always observed by them at undertaking the siege of a town, wherein they solemnly called upon the gods and goddesses of the place to forsake it and come over to them.

EVOCATORIA EPISTOLÆ, letters commanding or permitting the attendance of any person upon the Roman emperors.

EUODIA, in botany, a genus of the monogynian order, belonging to the tetrandrian class of plants. The calyx is a tetraphyllous perianth; the corol consists of four spathulated, sharp, and open petals; the stamens are four subulated filaments as long as the petals; the pericarp four roundish, bivalve, and monospermous capsules; the seeds solitary.

EVOLA'TION. *s.* (*evolo,* Lat.) The act of flying away.

EVOLI, an ancient town of Naples, in Italy. Lat. 40. 46 N. Lon. 15. 16 E.

To EVO'LVE. *v. a.* (*evolvo,* Latin.) To unfold; to disentangle (*Hale*).

To Evo'lve. *v. n.* To open itself; to disclose itself (*Prior*).

EVOLVENT, in the higher geometry, a term used by some writers for the involute, or curve resulting from the evolution of a curve.

EVOLUTE, in the higher geometry, a curve first proposed by M. Huygens, and since much studied by the late mathematicians. It is any curve supposed to be evolved or opened, by having a thread wrapped close upon it, fastened at one end, and beginning to evolve or unwind the thread from the other end, keeping the part evolved, or wound off, tight stretched; then this end of the thread will describe another curve called the involute. Or the same involute is described the contrary way, by wrapping the thread upon the evolute, keeping it always stretched.

Thus, if EFGH be any curve, and AE either a part of the curve, or a right line; then if a thread be wound close upon the curve from A to H, where it is fixed, and then be unwound from A; the curve AEFGH, from which it is evolved, is called the evolute; and the other curve ABCD described by the end of the thread, as it evolves or unwinds, is the involute. Or, if the thread HD, fixed at H, be wound or wrapped upon the evolute HGFEA, keeping it always tight, as at the several positions of it HD, GC, FB, EA, the extremity will describe the involute curve DCBA. Pl. 57. fig. 10.

From this description it appears, 1. That the parts of the thread at any positions, as EA, FB, GC, HD, &c. are radii of curvature, or osculatory radii, of the involute curve, at the points A, B, C, D.

2. The same parts of the thread are also equal to the corresponding lengths AE, AEF, AEFG, &c. of the evolute; that is,

AE = AE is the rad. of curvature to the point A,
BF = AF - - - - - B,
CG = AG - - - - - C,
DH = AH - - - - - D.

3. Any radius of curvature BF, is perpendicular to the involute at the point B, and is a tangent to the evolute curve at the point F.

4. The evolute is the locus of the centre of curvature of the involute curve.

The finding the radii of evolutes, is a matter of great importance in the higher speculations of geometry; and is often useful in practice; as is shewn by Huygens, the inventor of this theory, in applying it to the pendulum. Horol. Oscil. part 3.

The subject is well treated by some of the authors on fluxions, but we would particularly refer to Hayes, to Maclaurin's elegant work, art. 402, &c.; and Newton's as translated by Colson, p. 124. A very excellent article on the subject is given under the word Involution in the Supplement to the 3d edition of the Encyclopædia Britan. It will not admit of compression, and is much too long for the limits we are obliged to assign ourselves.

Evolute (Imperfect), a name given by M. Reaumur to a new kind of evolute. The mathematicians had hitherto only considered the perpendiculars let fall from the involute on the convex side of the evolute: but if other lines not perpendicular be drawn upon the same points, provided they be all drawn under the same angle, the effect will still be the same; that is, the oblique lines will all intersect in the curve, and by their intersections form the infinitely small sides of a new curve, to which they would be so many tangents. Such a curve is a kind of evolute, and has its radii; but it is an imperfect one, since the radii are not perpendicular to the first curve, or involute.

EVOLU'TION. *s.* (*evolutus,* Latin.) 1. The act of unrolling or unfolding (*Boyle*). 2. The series of things unrolled or unfolded (*More*).

Evolution, in geometry, the unfolding, or opening, of a curve, and making it describe an evolute.

The word *evolutio* is formed of the preposition *e, out*; and *volvo,* I roll, or wind; q. d. an unwinding, or unrolling.

Evolution, in arithmetic and algebra, denotes the extraction of the roots out of powers.

Evolution, in the art of war, the motion made by a body of troops, when they are obliged to change their form and disposition, in order to preserve a post or occupy another, to attack an enemy with more advantage, or to be in a condition of defending themselves the better. It consists in doublings, counter-marches, conversions, &c.

EVOLVULUS, in botany, a genus of the class pentandria, order tetragynia. Calyx five-leaved; corol five-cleft, wheel-shaped; capsule four-celled; seeds solitary. Seven species; chiefly herbaceous annuals of the East or West Indies.

EVOMI'TION. *s.* (*evomo,* Latin.) The act of vomiting out.

EUONYMUS. Spindle tree. In botany, a genus of the class pentandria, order monogynia. Corol flat, five-petalled; capsule five-angled, five-celled, five-valved, coloured; seeds enveloped in a pulpy coat. Seven species: scattered over Europe, Asia, and America; of which one, e. Europæus, is common to the hedges of our own country, with an upright arboreous stem, rising ten or fifteen feet, and glabrous opposite leaves. E. Americanus, a native of Virginia, is frequently propagated among ourselves; and will bear the change of climate well. The wood cut while the plant is in blossom, is extremely tough, and used by watch-makers for cleaning watches; and by toy-makers for tooth-picks, and other small wares.

Euonymus (Bastard). See Celastrus.

Euonymus (Climbing). See Celastrus.

EVORA, a fortified city of Portugal, capital of Alentejo, with an archbishop's see, and a university. Some remains of the ancient Roman wall are visible, and the famous aqueduct built by Sertorius still conveys a noble stream of water to the city. Evora is seated in a country which, though a little unequal, is very pleasant, surrounded on all sides by mountains, and planted with large trees of divers sorts. It is 65 miles E. by S. of Lisbon. Lon. 7. 30 W. Lat. 38. 28 N.

EUPA'REA, in botany, a genus of the class pentandria, order monogynia. Calyx five-leaved; corol from five to twelve-petalled; berry superior, juiceless, many-seeded. One species only; a native of New Holland.

EU'PATHY. (from ευ, well, and παθεια, affection.) In medicine, a good state of the body. Excellent health.

EUPATOR, a surname given to many of the Asiatic princes; as Mithridates, &c.

EUPATO'RIUM. Hemp-agrimony. In botany, a genus of the class syngenesia, order polygamia æqualis. Receptacle naked; down simple or rough; calyx imbricate or oblong; style longer than the flowers, cloven half its length. Seventy species; some with a calyx containing from three to five flowers; others with a calyx possessing six-florets; the greater number American plants, but one, e. cannabinum, found on the watery banks of our own country, with petioled leaves, in three or five lanceolate, serrate leaflets; the terminal ones longer. There is another variety with undivided leaves. Each is a very strong smelling and bitter plant; the juice of which proves violently emetic and purgative, and promotes the secretions. It is still used in Holland in jaundice, dropsies, and scurvies.

EUPATRIDÆ, in antiquity, a name given by Theseus to the nobility of Athens, to distinguish them from *geomori*, the husbandmen, and *demiurgi*, the artificers.

EUPEPSY. (from ευ, well, and πεπτω, to concoct.) In medicine, good digestion: the reverse of dyspepsy.

EUPEPTIC. (*eupeptica*, ευπεπτικα; from ευ, good, and πεπτω, to digest.) Substances are so called that are easy to digest, or that produce good digestion.

EUPHEMIA, a sea-port town of Naples, in Italy. Lat. 38. 44 N. Lon. 16. 32 E.

EUPHEMISM, in rhetoric, a figure which expresses things in themselves disagreeable and shocking, in terms implying the contrary quality: thus, the Pontus, or Black sea, having the epithet αξενος, *i. e.* inhospitable, given it, from the savage cruelty of those who inhabited the neighbouring countries, this name, by euphemism, was changed into that of Euxinus.

Thus Ovid, Trist. lib. iii. el. 13.

> "Dum me terrarum pars penè novissima
> Ponti,
> Euxinus falso nomine dictus, habet"

And again, in Trist. lib. v. el. 10.

> "Quem tenet Euxini mendax cognomine
> litus."

In which significations, nobody will deny its being a species of irony: but every euphemism is not irony, for we sometimes use improper and soft terms in the same sense with the proper and harsh.

EUPHON, a musical instrument invented by Dr. Chladni, of Gottingen, in 1790, and to which this name is appropriated on account of its pleasant sound. In this instrument the sounds are drawn from glass tubes like those made for thermometers, which are of different colours: the whole tones being denoted by green tubes, the half tones by milk white ones: "The euphon has some resemblance to a small writing desk. When opened, the above-mentioned glass tubes, of the thickness of the barrel of a quill, and about sixteen inches long, are seen in a horizontal position. They are wetted with water, by means of a sponge, and stroked with the wet fingers in the direction of their length, so that the increase of the tone depends merely on the stronger or weaker pressure, and the slower or quicker movement of the fingers. The number of tubes at present is forty-two. In the back part there is a perpendicular sounding-board divided in the middle, through which the tubes pass. It appears therefore that the euphon ought not to be considered as an altered or improved Armonica, but as a totally new and different instrument In regard to sweetness of sound, it approaches very near to the Armonica; but it has several advantages which no unprejudiced person, who examines both instruments, will deny.

"In the first place it is simpler, both in regard to its construction and the movement necessary to produce the sound, as neither turning nor stamping is required, but merely the movement of the finger.

"2. It produces its sound speedier; so that as soon as it is touched you may have the tone as full as the instrument is capable of giving it; whereas, in the Armonica, the tones, particularly the lower ones, must be made to increase gradually.

"3. It has more distinctness in the quick passages, because the tones do not resound so long as in the Armonica, where the sound of one low tone is often heard when you wish only to hear the following tone.

"4. The unison is purer than is generally the case in the Armonica, where it is difficult to have perfect glasses, which in every part give like tones with mathematical exactness. It is however as difficult to be tuned as the Armonica.

"5. It does not affect the nerves of the performer; for a person scarcely feels a weak agitation in the fingers; whereas in the Armonica, particularly in concords of the lower notes, the agitation extends to the arms and even through the whole body of the performer.

"6. The expence of this instrument will be much less than that of the Armonica.

"7. When one of the tubes breaks, or any other part is deranged, it can be soon repaired, and at very little expense; whereas, when one of the glasses of the Armonica breaks, it requires much time and is very difficult to procure another capable of giving the same tone as the former, and which will correspond sufficiently with the series of the rest." See ARMONICA.

From the history of the invention of this instrument, as related in vol. 2. of the Philosophical Magazine, it appears, that Dr. Caladni after various fruitless attempts for the space of a year and a half, at length in a state of slumber had presented to him an image of the instrument he wished for, very soon after which he completely accomplished his intended object.

EUPHO'NICAL. *a.* (from *euphony.*) Sounding agreeably.

EUPHONY. *s.* (*ευφωνια.*) An agreeable sound: the contrary to harshness.

EUPHORBIA. In botany. Spurge. A genus of the class and order dodecandria, trigynia. Calyx one-leafed, inflated, nectaries four or five standing on the calyx; capsule on a pedicel, three lobed. A hundred and twenty species; natives of warm climates, and some few of our own country. They may be subdivided as follows:

A. Shrubby, prickly.
B. Shrubby, unarmed; stem not forked nor umbelliferous.
C. Forked; umbel bifid, or none.
D. Umbel three-rayed.
E. Umbel four-rayed.
F. Umbel five-rayed.
G. Umbel many rayed.

They all produce a highly pungent and acrimonious fluid; discharged upon puncturing in the semblance of milk; and by this appearance many of the species may be distinguished from the cactus, which they resemble in external character. The acrimony of the juices of several species is so great as to prove a fatal and almost instantaneous poison: and the Hottentots are in the common habit of arming their poisoned arrows from a preparation of this juice: as they also are of poisoning animals, on particular occasions, by infusing the leaves of these species in the waters they frequent. There is one species, however,

1. E. balsamifera, that exudes at the same time a pleasant and salutary balsam.

The rest that are chiefly worth noticing are,

2. E. canariensis; affording the gum euphorbium.

3. E. cyparissus. Cypress spurge, employed in the dispensatories under the name of ESULA MINOR, which see.

4. E. officinarum; the common spurge of the shops: of which there are two varieties, the one differing from the other in having the angles of the stem repand.

5 E. palustris; employed also in medicine under the name of ESULA MAJOR, which see.

6. E. paralias; used in the pharmacopœias under the officinal name of TITHYMALUS PARALIOS, which see.

7. E. petiolaris; long-stalked spurge, an elegant plant with slender woody stem, petioles in the whorls, solitary flowers. It is a native of the West Indies; and, like the other tropical euphorbias, should be kept in the dry stove. See Botany, Pl. CX.

EUPHORBIUM. (*euphorbium*; from *Euphorbus*, the physician of king Juba, in honour of whom it was named.) An inodorous gum-resin in yellow tears, which have the appearance of being worm-eaten; said to be obtained from several species of euphorbiæ, but principally from the euphorbia canariensis, and euphorbia officinarum; aculeata nuda multangularis, aculeis germinatis, of Linnéus; it is imported from Ethiopia, Libya, and Mauritania. It contains an active resin, and is very seldom employed but as an errhine.

EUPHORION. The most remarkable of this name is a Greek poet of Chalcis in Eubœa, in the age of Antiochus the Great. Tiberius took him for his model for correct writing. He died in his 56th year, B. C. 220.

EUPHRASIA. Eye-bright. In botany, a genus of the class didynamia, order angiospermia. Calyx cylindrical, four-cleft, equal: upper lip of the corol cloven; lower-lip three-lobed, with the lobes cloven; anthers awned with unequal spines; capsule ovate-oblong, two-celled; seeds striate. Eleven species; chiefly natives of the south of Europe: but one, e. officinalis, indigenous to our own pastures, with leaves ovate, obtusely toothed; lobes of the lower lip of the corol emarginate: flowers blue. It is esteemed by the vulgar as a remedy for all diseases of the eyes, and was formerly an article in the Materia Medica of many dispensatories. It is an ingredient in the English herb-tobacco. There are one or two other plants which have been mistaken by some naturalists for indigenous species of euphorbia; but e. officinalis is the only plant that is found native in our own country.

EUPHRATES, one of the most celebrated rivers in the world, and the principal of Turkey in Asia. It has its rise about a day's journey from Erzerum; and another source about two days journey from the same place. They both lie to the eastward, on high mountains covered with snow almost the year round. The plain of Erzeram is inclosed between two fine streams, which, when united, are called the Euphrates, or the Frat. After their junction, three days journey from Erzerum, it begins to be navigable for boats; but the channel is so rocky, that the navigation is not safe. At first it runs S.S.W. then S. till it approaches nearest to Aleppo: when it runs S.E. till it reaches Rakka. It afterwards turns more to the S. till it comes to Meshed; and then passes S.E. again by Anna, Hit, Cubessa, and Felugia; and, not far thence, visits the spot where Babylon stood. It then fetches a compass like a bow, till it runs E. and unites with the Tigris; and, still retaining its name, it runs to Bussarah, and thence into the gulf of Persia, about 50 miles below it. It first divides Armenia from Natolia; then Syria from Diarbeck: after which it runs through Irac Arabia till it meets the Tigris. It is also the north-eastern boundary of the great desert of Arabia.

EUPOLIS, a comic poet of Athens, who flourished 435 years before the Christian æra. He severely lashed the vices and immoralities of his age. It is said that he had composed 17 dramatical pieces at the age of 17. Some suppose that Alcibiades put Eupolis to death, because he had ridiculed him in his verses; but Suidas maintains that he perished in a sea-fight between the Athenians and the Lacedæmonians in the Hellespont. (*Hor.*)

EURE, a department of France, which includes part of the late province of Normandy, and is so named from a river which rises in Perche, in the forest of Logny, and falls into the Seine, above Pont-d'Arche. Evreux is the capital.

Eure and Loire, a department of France, so called from the rivers of that name. It contains the late province of Beauce, and its capital is Chartres.

EVREMONT, ST. (Charles de St. Denis, lord of), a celebrated French writer. He was born in Normandy, in 1613, and being a younger son was designed for the law. After going through the necessary course of studies, he abandoned that profession, and adopted the military life. In 1640 he was at the siege of Arras, and not long after the duke of Enguien made him lieutenant of his guards on purpose to have him near his person. This post, however, he lost in 1648, on account of some satirical expression which he had made use of, for though the duke could give, he did not like to take a joke. When the civil war broke out he received the commission of a major-general, with a pension of 3000 livres a year. In 1657 he fought a duel with the marquis de Force, on which account he was obliged to keep himself concealed till his friends could obtain a pardon. In 1659 he served in Flanders, and soon afterwards attended cardinal Mazarine when he went to conclude a peace with the prime minister of Spain. While this negociation was going on, he wrote a confidential letter to the marquis of Crequi, in which he charged the cardinal with having sacrificed the welfare of France to his own private interests. This letter somehow or other got into the hands of some of Mazarine's friends after his death, and was made such use of by them, that the author was glad to escape from France. He was well known and esteemed in England, and thither he repaired. After staying here some time he went to Holland, with a view of settling there, but at the express invitation of Charles II. he returned to England, where he spent the remainder of his days very agreeably, and died in 1703. His remains were interred in Westminster abbey, where there is a monument to his memory. St. Evremont was a man of infinite wit, and considerable ingenuity. His works were printed in 1728, in 3 vols. 8vo. (*Watkins*)

EVREUX, an ancient town of France, capital of the department of Eure, with a bishop's see. Here are manufactures of cloths and velvets. Lat. 49. 1 N. Lon. 1. 14 E.

EURIPIDES, a celebrated tragic poet born at Salamis. He studied eloquence under Prodicus, ethics under Socrates, and philosophy under Anaxagoras. He applied himself to dramatical composition, and his writings became so much the admiration of his countrymen, that the unfortunate Greeks, who had accompanied Nicias in his expedition against Syracuse, were freed from slavery, only by repeating some verses from the pieces of Euripides. Euripides and Sophocles viewed each others talents with a most illiberal jealousy, which gave an opportunity to the comic muse of Aristophanes to ridicule them both on the stage with success and humour. The ridicule and envy to which he was continually exposed, obliged him at last to remove from Athens. He retired to the court of Archelaus, king of Macedonia, where he received the most conspicuous marks of royal munificence. His end was most deplorable. It is said that the dogs of Archelaus met him in his solitary walks, and tore his body to pieces, 407 years before the Christian æra, in the 78th year of his age. Euripides wrote 75 tragedies, of which only 19 are extant. He is peculiarly happy in expressing the passions of love, especially the more tender and animated To the pathos he has added sublimity, and the most common expressions have received a perfect polish from his pen. The best editions of the remaining tragedies are those of Commelin, in 1597; Stevens, in 1604; Barnes, in 1694; and Musgrave, in 1778. Euripides has been well translated into English by Woodhouse and Potter.

EURIPUS, now the Negropont, a canal or strait which divides the island of Eubœa from the continent of Greece. In one place it is so narrow that a galley can scarce pass through it. The agitations of the Euripus were much spoken of by the ancients. Some say that the canal has a flux and reflux six times in 24 hours; others that it ebbs and flows seven times a day; but Livy does not allow this flux and reflux to be so regular. In this place, as the story commonly goes, Aristotle drowned himself out of chagrin, for not being able to account for so unusual a motion. Euripus has since become a general name for all straits, where the water is in great motion and agitation. The ancient circuses had their euripi, which were no other than pits or ditches on each side of the course, into which it was very dangerous falling with their horses and chariots as they ran races.

EUROCLYDON. (of Ευρος, east-wind, and κλυδων, wave.) Is a species of wind, of which we have an account only in Acts xvii. 14. and concerning the nature of which critics have been much divided. Bochart, Grotius, Bentley, and others, substitute another reading, supported by the Alexandrian MS. and the Vulgate, viz. Ευρακυλων, or *Euro-aquilo*; but Mr. Bryant defends the common reading, and considers the Euroclydon, i. e. Ευρος κλυζων, as an east-wind that causes a deep sea or vast inundation. He maintains, in opposition to Dr. Bentley's reasoning, who supposes that the mariners in the ship, the voyage of which is recited in this passage, were Romans, that they were Greeks of Alexandria, and that the ship was an Alexandrian ship employed in the traffic of carrying corn to Italy; and therefore, that the mariners had a name in their own language for the particular typhonic or stormy wind here mentioned.

EUROPA, in fabulous history, a daughter of Agenor, king of Phœnicia, so beautiful that Jupiter became enamoured of her, who, the better to seduce her, assumed the shape of a bull, and mingled with the herds of Agenor, while Europa, with her female attendants, were gathering flowers in the meadows. Europa caressed the animal, and at last had the courage to sit upon his back. The god took advantage of her situation, and with precipitate steps retired towards the shore, and crossed the sea with Europa on his back, and arrived safe in Crete. Here he assumed his original shape, and declared his love. The nymph consented, though she had before made vows of perpetual celibacy, and she became mother of Minos, Sarpedon, and Rhadamanthus. After this distinguished amour with Jupiter, she married Asterius, king of Crete. Minos succeeded to the throne of Asterius. Some suppose that Europa lived about 1552 years before the Christian æra. (*Ovid*. &c. &c.)

EUROPE, called by the people of Asia *Frankistan*, one of the four grand divisions of the world. We may state in general, that towards the E. it is bounded by Asia, without ascertaining the boundary lines more nearly than we have done under the article ASIA: elsewhere the limits are more accurately defined, as from the sea of Asoph to the Mediterranean on the south-east, through the Euxine or Black sea, the Bosphorus, the sea of Marmora, the Dardanelles, and the Archipelago; on the south it is bounded by the Mediterranean; on the west by the Atlantic; and on the north by the Frozen sea: Cabo di Rocca, or the Rock of Lisbon, on the coast of Portugal, being the most westerly point of land, 8. 40 W. of Greenwich; and probably the most easterly may be about the 57° or 58° of E. longitude. Its extent from south to north is supposed to be from about the 26th to the 72d degree of north latitude. It is much more populous, and better cultivated, than either Asia or Africa. It is fuller of villages, towns, and cities, and the buildings are stronger, more elegant and commodious, generally speaking, than in the two former. The inhabitants are all whites, and, for the most part, much better made than the Africans, or even the Asiatics. With regard to arts and sciences, there is no manner of comparison; nor yet in trade, navigation, and war. The number of inhabitants in Europe is calculated at 150 millions; but it is certainly capable of supporting a much greater number. These form different states, which are sometimes united and sometimes divided, as different political interests may weigh; each state speaks a different language, many of which are derived from the same original source, or are a mixture of others formed and sanctioned by time. Europe may be divided into sixteen parts, four to the north, viz. the British islands, Denmark with Norway, Sweden, and Russia; eight in the centre, viz. France, Netherlands, Swisserland, Germany, Bohemia, Hungary, Poland, and Prussia; and four to the south, viz. Portugal, Spain, Italy, and European Turkey. Its length from east to west is reckoned above 1100 leagues, and breadth from north to south about 900. Although Europe is the smallest quarter of the world in point of extent, yet it may be considered as the principal in every thing relating to man in society; mildness of air, fertility of soil; whence are produced all the necessaries, and most of the luxuries of life; for the beauty, strength, courage, and wisdom of its inhabitants; the excellence of its government, laws, and religion. The principal islands of Europe are Great Britain, Ireland, the Orcades, the Hebrides, Iceland; the isles of Ferro in the Atlantic; Sicily, Sardinia, Corsica, Candia, the Greek isles, Majorca, Minorca, and others in the Mediterranean; and in the Baltic are Zealand, Funen, Rugen, Bornholm, Gottland, Oesel, &c. The most considerable rivers are the Po and the Tiber in Italy; the Rhine, the Danube, the Elbe, and the Oder, in Germany; the Loire, the Seine, the Rhone, and the Garonne, in France; the Tagus and the Duero in Spain; the Vistula in Poland; the Dnieper, the Volga, and the Don, in Russia; the Thames and the Severn in England; the Tay in Scotland; the Shannon in Ireland; the Scheldt and Meuse in the Netherlands, &c. The chief mountains are the Alps, Appennines, and Pyrenees. The prevailing religion is the Christian, divided into the Greek, Romish, and Protestant churches. There are also Jews in every country, and Mahometanism is the established religion of the Turks. Europe is entirely within the temperate zone, except a small part of Norway and Russia; so that the inhabitants of this quarter of the world are so situated, as to be free from both the excessive heat and insupportable cold of other parts of the continent.

EURYALE, in mythology, one of the Gorgons, daughter of Phorcys, and sister of Medusa: she was subject neither to old age nor death.

EURYANDRA, in botany, a genus of the trigynia order, belonging to the polyandria class of plants. The calyx is a pentaphyllous perianth, with small, roundish, and concave leaves; the corol consists of three roundish hollow petals, longer than the calyx. The stamens are very many capillary filaments much dilated at the apex; the pericarp three egg-shaped follicles, containing several seeds.

EURYDICE, in fabulous history, the wife of Orpheus, who, flying from Aristæus that endeavoured to ravish her, was slain by a serpent. Her husband went down to the shades, and by the force of his music persuaded Pluto and Proserpine to give him leave to carry back his wife; which they granted, provided he did not look on her till he came to the light; but he breaking the condition, was forced to leave her behind him.

EURYTHMY, in architecture, painting, and sculpture, is a certain majesty, elegance, and easiness, appearing in the composition of divers members or parts of a body, painting, or sculpture, and resulting from the fine proportion of it.

EUSEBIUS (Pamphilus), an ecclesiastical historian, born in Palestine about 267. He received deacon's orders from Agapius, bishop of Cæsarea, where he had been educated. In the time of Dioclesian's persecution, he greatly assisted the suffering Christians by his pious exhortations, particularly his friend Pamphilus, whose name out of veneration he assumed. However he has been charged with having temporized in his own conduct at that time, but apparently on no just grounds. When peace was restored to the church, Eusebius was chosen bishop of Cæsarea, about 313. Shortly after this he was engaged in the dispute kindled by Arius, with whom he sided at first. but rather from a dislike of persecution, than from an approbation of that heresiarch's notions. He assisted at the council of Nice, and also at that of Antioch, where he was appointed bishop of that see, which he declined accepting. The emperor Constantine had a very particular esteem for him, and shewed him several tokens of favour. He died about 338. He wrote an Ecclesiastical History, the Life of Constantine, and other works. The best edition of his Præparatio & Demonstratio Evangelica, is that of Vigerus, folio, two vols. 1628; and of his Ecclesiastical History, that of Cambridge, folio, 1720.

EUSERA, in zoology, a tribe of the hymenopterous genus of insects apis, thus denominated in the Fabrician system of entomology. See APIS.

EUSTACHIAN TUBE. (*tuba Eustachiana.*) The tube so called was discovered by the great Eustachius. It begins, one in each ear, from the anterior extremity of the tympanum, and runs forwards and inwards in a bony canal, which terminates with the petrous portion of the temporal bone. It then goes on, partly cartilaginous and partly membranous, gradually becoming larger, and at length ends behind the soft palate. Through this tube the air passes to the tympanum.

EUSTACHIAN VALVE. See VALVULA EUSTACHII.

EUSTACHIUS (Bartholomew), physician and anatomist at Rome, flourished about the year 1550.

EUSTATHIANS, the same with the catholics of Antioch, in the fourth century; so called from their refusing to acknowledge any other bishop beside St. Eustathius, who was deposed by the Arians.

EUSTATIA (St.), one of the least of the Leeward islands in the West Indies, which properly is nothing but a mountain in the form of a sugar loaf, whose top is hollow. It is strong by situation, and has a good fort. It lies to the N.W. of St. Christopher's, and belongs to the Dutch, from whom it was taken by admiral Rodney in 1781; but was soon after taken by the French, and restored to the Dutch by the peace of 1783. Lat. 17. 29 N. Lon. 63. 5 W.

EUSTEPHIA, in botany, a genus of the class hexandria, order monogynia. Corol superior, tubular, cylindrical, bifid; nectary six cavities in the tube of the corol; filaments tricuspidate, distinct. One species only: a native of South America, with linear obtuse leaves; and four scarlet nodding flowers.

EUSTYLE. (formed of *ευ*, *bene*, well, and *ςυλος*, column.) In architecture, a kind of edifice, where the columns are placed at a most convenient distance one from another, the intercolumniations being all just two diameters and a quarter of the column, except those in the middle of the fronts, before and behind, which are three diameters distant.

EURYA, in botany, a genus of the class dodecandria, order monogynia. Calyx double; the outer two-leaved, inner five-leaved; petals five; capsule five-celled, many-seeded. One species only: a native of Japan, with a shrubby stem, ever-green, alternate leaves, and axillary flowers.

EUTERPE, one of the Muses, daughter of Jupiter and Mnemosyne. She presided over music, and was looked upon as the inventress of the flute. She is represented as crowned with flowers, and holding a flute in her hands.

EUTHANASIA. (*ευθανασια.*) An easy death.

EUTHYMIA, among the Greeks, signified such a disposition, or state of mind, as could not be ruffled.

EUTROPIUS, a Latin historian in the age of Julian, under whom he carried arms in the fatal expedition against the Persians. His origin as well as his dignity are unknown. He wrote an epitome of the history of Rome, from the age of Romulus to the reign of the emperor Valens, to whom the work was dedicated. Of all his works, the Roman history alone is extant. It is composed with conciseness and precision, but without elegance.

EUTYCHIANS, an ancient sect, which

denied the duplicity of natures in Christ; thus denominated from Eutyches, the archimandrite, or abbot of a monastery at Constantinople, who began to propagate his opinion A.D. 448. He did not, however, seem quite steady and consistent in his sentiments: for he appeared to allow of two natures, even before the union; which was apparently a consequence he drew from the principles of the Platonic philosophy, which supposes a pre-existence of souls: accordingly, he believed that the soul of Jesus Christ had been united to the divinity before the incarnation; but then he allowed no distinction of natures in Jesus Christ since his incarnation.

EUTYCHIANS was also the name of another sect, half Arian, half Eunomian; which arose at Constantinople in the fourth century. It being then a matter of mighty controversy among the Eunomians at Constantinople, whether or no the son of God knew the last day and hour of the world, particularly with regard to that passage in the gospel of St. Matthew, chap. xxiv. ver. 36. or rather that in St. Mark, xiii. 32. where it is expressed, that the Son did not know it, but the Father only; Eutychius made no scruple to maintain, even in writing, that the Son did not know it; which sentiment displeasing the leaders of the Eunomian party, he separated from them, and made a journey to Eunomius, who acquiesced fully in Eutychius's doctrine, and admitted him to his communion.

EVU'LSION. *s.* (*evulsio*, Lat.) The act of plucking out (*Brown*).

EVULGA'TION. *s.* (*evulgo*, Latin.) The act of divulging; publication.

EUXINE, or BLACK SEA, forms part of the boundary betwixt Europe and Asia. It was anciently called the Axenus, from Ashkenaz, the son of Gomer, who is said to have settled near it. The original being forgot in length of time, the Greeks explained it by inhospitable, which the word Axenus literally signifies; and, therefore, when they came to consider the inhabitants of these coasts as more civilized and hospitable, they changed the name into Euxinus, which it still retains.

EWAGE, in old customs, toll paid for water passage.

EWE. *s.* (eope, Saxon.) The she sheep. See OVIS.

EWELL, a town in Surrey, with a market on Thursdays. It is seated on a rivulet which empties itself into the Thames at Kingston. Lat. 51. 26 N. Lon. 0. 15 W.

E'WER. *s.* (from *eau*, perhaps anciently *eu*, water.) A vessel in which water is brought for washing the hands (*Pope*).

E'WRY. *s.* (from *ewer.*) An office in the king's household, where they take care of the linen of the king's table, lay the cloth, and serve up water in silver ewers after dinner.

EX, a Latin preposition, often prefixed to compound words; sometimes meaning *out*, as *exhaust*, to draw *out*, and sometimes only enforcing the meaning.

EX, a river which rises in the forest of Exmoor, in Somersetshire, and leaving that county below Dulverton, runs to Tiverton, Exeter, and Topsham, whence it forms an estuary, which terminates in the English channel at Exmouth.

EX OFFICIO, among lawyers, signifies the power a person has, by virtue of his office, to do certain acts without being applied to. Thus a justice of peace may *ex officio*, at his discretion, take surety of the peace, without complaint made by any person whatsoever. There was formerly an oath *ex officio*, whereby a supposed offender was compelled in the ecclesiastical court to confess, accuse, or clear himself of a crime; but this law is repealed.

EX POST FACTO, in law, something done after another: thus an estate granted may be good by matter *ex post facto*, that was not so at first, as in case of election.

To EXACE'RBATE. *v. a.* (*exacerbo*, Lat.) To embitter; to exasperate.

EXACERBA'TION. *s.* (from *exacerbate.*) 1. Increase of malignity; augmented force or severity. 2. Height of a disease; paroxysm (*Bacon*).

EXACERVA'TION. *s.* (*exacervus*, Lat.) The act of heaping up.

EXA'CT. *a.* (*exactus*, Lat.) 1. Nice; not deviating from rule (*Pope*). 2. Methodical; not negligently performed. 3. Careful; not negligent (*Spectator*). 4. Honest; strict; punctual (*Ecclus*).

To EXA'CT. *v. n.* (*exigo*, *exactus*, Lat.) 1. To require authoritatively (*Taylor*). 2. To demand of right (*Smalridge*). 3. To summon; to enjoin (*Denham*).

To EXA'CT. *v. n.* To practise extortion (*Psalms*).

EXA'CTER. *s.* (from *exact.*) 1. Extortioner; one who claims more than his due (*Bacon*). 2. He that demands by authority (*Bacon*). 3. One who is severe in his injunctions or his demands (*Tillotson*).

EXA'CTION. *s.* (from *exact.*) 1. The act of making an authoritative demand, or levying by force (*Shakspeare*). 2. Extortion; unjust demand (*Davies*). 3. A tribute severely levied (*Addison*).

EXA'CTLY. *ad.* (from *exact.*) Accurately; nicely; thoroughly (*Atterbury*).

EXA'CTNESS. *s.* (from *exact.*) 1. Accuracy; nicety; strict conformity to rule or symmetry (*Woodward*). 2. Regularity of conduct; strictness of manners; care not to deviate (*Rogers*).

EXACUM, in botany, a genus of the class tetrandria, order monogynia. Calyx four-leaved, or four-cleft; corol four or five-cleft, with an inflated tube; capsule two-grooved, two-celled, many-seeded, opening at top: stigma capitate. Eighteen species; chiefly natives of the East Indies, or South America. One indigenous to the marshes of our own country, e. filiforme, with sessile leaves; and flowers on long stalks.

To EXA'GGERATE. *v. a.* (*exaggero*, Lat.) 1. To heap upon; to accumulate (*Hale*). 2. To heighten by representation (*Clarendon*).

EXAGGERA'TION. *s.* (from *exaggerate.*)

1. The act of heaping; a heap (*Hale*). 2. Hyperbolical amplification (*Swift*).

To EXA'GITATE. *v. a.* (*exagito*, Latin.) 1. To shake; to put in motion (*Arbuthnot*). 2. To reproach; to pursue with invectives: not in use (*Hooker*).

EXAGITATION. *s.* (from *exagitate.*) The act of shaking or agitating.

To EXA'LT. *v. a.* (*exalter*, French.) 1. To raise on high (*Matthew*). 2. To elevate to wealth or dignity (*Ezekiel*). 3. To elevate to joy or confidence (*Clarendon*). 4. To praise; to extol; to magnify (*Psalms*). 5. To raise up in opposition (*Kings*). 6. To intend; to enforce (*Prior*). 7. To heighten; to refine by fire (*Arbuthnot*). 8. To elevate in diction or sentiment (*Roscommon*).

EXALTATION. *s.* (from *exalt.*) 1. The act of raising on high. 2. Elevation to power or dignity (*Hooker*). 3. Elevated state; state of greatness or dignity (*Tillotson*). 4. (In pharmacy.) Raising a medicine to a higher degree of virtue (*Quincy*). 5. Dignity of a planet in which its powers are increased in astrology (*Dryden*).

EXALTATION OF THE CROSS. See CROSS.

EXA'MEN. *s.* (Lat.) Examination; disquisition; inquiry (*Brown*).

EXA'MINATE. *s.* (*examinatus*, Lat.) The person examined (*Bacon*).

EXAMINA'TION. *s.* (*examinatio*, Latin.) The act of examining by questions, or experiment; accurate disquisition (*Locke*).

EXAMINA'TOR. *s.* (Lat.) An examiner; an inquirer (*Brown*).

To EXA'MINE. *v. a.* (*examino*, Latin.) 1. To try a person accused or suspected by interrogatories (*Church Catechism*). 2. To interrogate a witness (*Acts*). 3. To try the truth or falsehood of any proposition. 4. To try by experiment, or observation; to narrowly sift; to scan. 5. To make inquiry into; to search into: to scrutinize (*Locke*).

EXA'MINER. *s.* (from *examine.*) One who searches into the veracity of an evidence. 2. One who searches or tries any thing; one who scrutinizes.

EXAMINERS, in chancery, are two officers, whose business is to examine, on oath, the witnesses produced on both sides, upon such interrogatories as the parties to the suit do exhibit for the purpose.

EXA'MPLARY. *a.* (from *example.*) Serving for example or pattern (*Hooker*).

EXA'MPLE. *s.* (*exemple*, French.) 1. Copy or pattern; that which is proposed to be resembled (*Raleigh*). 2. Precedent; former instance of the like (*Shakspeare*). 3. Precedent of good (*Milton*). 4. A person fit to be proposed as a pattern (*Timothy*). 5. One punished for the admonition of others (*Jude*). 6. Influence which disposes to imitation (*Rogers*). 7. Instance; illustration of a general position by some particular specification (*Dryden*). 8. Instance in which a rule is illustrated by an application (*Dryden*).

To EXA'MPLE. *v. a.* (from the noun.) 1. To exemplify; to give an instance of (*Sp.*). 2. To set an example (*Shakspeare*).

EXA'NGUIOUS. *a.* (*exanguis*, Lat.) Having no blood; formed with animal juices, not sanguineous (*Brown*).

EXA'NIMATE. *a.* (*exanimatus*, Lat.) 1. Lifeless; dead. 2. Spiritless; depressed (*Thomson*).

EXANIMATION. *s.* (from *exanimate.*) Deprivation of life.

EXA'NIMOUS. *a.* (*exanimis*, Lat.) Lifeless; dead; killed.

EXANTHEMA. (*exanthema*, εξανθημα, from εξανθεω, to spring forth, to bud.) An eruption of the skin. Cullen makes exanthematæ an order in the class pyrexiæ. It includes contagious diseases, beginning with fever, and followed by an eruption on the skin.

EXANTHE'MATOUS. *a.* (from *exanthemata.*) Pustulous; efflorescent; eruptive.

To EXA'NTLATE. *v. a.* (*exantlo*, Latin.) 1. To draw out. 2. To exhaust; to waste away (*Boyle*).

EXANTLATION. *s.* (from *exantlate.*) The act of drawing out; exhaustion.

EXARATE, in botany, scored or underlined, as by a pen.

EXARATION. *s.* (*exaro*, Latin.) The manual act of writing.

EXARCH, in antiquity, an appellation given, by the emperors of the East, to certain officers sent into Italy, in quality of vicars, or rather prefects, to defend that part of Italy which was yet under their obedience; particularly the city of Ravenna against the Lombards, who had made themselves masters of the greatest part of the rest.

EXARCH OF A DIOCESE, was, anciently, the same with primate. Exarch also denotes a kind of deputy, or *legate à latere* of the patriarch in the Greek church. It is likewise used in the Eastern church antiquity for a general or superiour over several monasteries.

EXARTICULATION. *s.* (*ex* and *articulus*, Latin.) The dislocation of a joint.

To EXA'SPERATE. *v. a.* (*exaspero*, Lat.) 1. To provoke; to enrage; to irritate (*Addison*). 2. To heighten a difference; to aggravate; to embitter (*Bacon*). 3 To exacerbate; to heighten malignity (*Bacon*).

EXASPERATE, in botany, roughened.

EXASPERA'TER. *s.* (from *exasperate.*) He that exasperates; a provoker.

EXASPERA'TION *s.* (from *exasperate.*) 1. Aggravation; malignant representation (*K. Charles*). 2. Provocation; irritation (*Atterbury*).

To EXAU'CTORATE. *v. a.* (*exauctoro*, Lat.) 1. To dismiss from service. 2. To deprive of a benefice (*Ayliffe*).

EXAUCTORATIO, in the Roman military discipline, a partial discharge, which took place after the soldiers had served seventeen years; at this period they lost their pay. The *missio*, or full discharge, took place after they had been in the army twenty years.

EXAUCTORA'TION. *s.* (from *exaucto-*

rate.) 1. Dismission from service. 2. Deprivation; degradation (*Ayliffe*).

EXCALCEATION, among the Hebrews, a law whereby a widow, whom her husband's brother refused to marry, might summon him to a court of justice, and, on his refusal, might pull off one of his shoes and spit in his face: both being reckoned very ignominious.

EXCANDE'SCENCE. EXCANDE'SCENCY. *s.* (*excandesco*, Lat.) 1. Heat; the state of growing hot. 2. Anger; the state of growing angry.

EXCANTA'TION. *s.* (*excanto*, Lat.) Disenchantment by a counter charm.

To EXCA'RNATE. *v. a.* (*ex* and *carnis*, Lat.) To clear from flesh (*Grew*).

EXCARNIFICA'TION. *s.* (*excarnifico*, Lat.) The act of taking away the flesh.

To E'XCAVATE. *v. a.* (*excavo*, Lat.) To hollow; to cut into hollows (*Blackmore*).

EXCAVA'TION. *s.* (from *excavate*.) 1. The act of cutting into hollows. 2. The hollow formed; the cavity (*Wotton*).

To EXCE'ED. *v. a.* (*excedo*, Latin.) 1. To go beyond; to outgo (*Woodward*). 2. To excel; to surpass (*Kings*).

To EXCE'ED. *v. n.* 1. To go too far; to pass the bounds of fitness (*Taylor*). 2. To go beyond any limits (*Deuteronomy*). 3. To bear the greater proportion (*Dryden*).

EXCE'EDING. *part. a.* (from *exceed*.) Great in quantity, extent, or duration (*Raleigh*).

EXCE'EDING. *ad.* In a very great degree; eminently (*Raleigh*).

EXCE'EDINGLY. *ad.* To a great degree; greatly; very much (*Newton*).

To EXCE'L. *v. a.* (*excello*, Lat.) To outgo in good qualities; to surpass (*Prior*).

To EXCE'L. *v. n.* To have good qualities in a great degree; to be eminent (*Temple*).

E'XCELLENCE. E'XCELLENCY. *s.* (*excellence*, French; *excellentia*, Latin.) 1. The state of abounding in any good quality. 2. Dignity; high rank in existence (*Dryden*). 3. The state of excelling in any thing (*Locke*). 4. That in which one excels (*Addison*). 5. Purity; goodness (*Shakspeare*). 6. A title of honour. Usually applied to ambassadours and governours (*Shakspeare*).

E'XCELLENT. *a.* (*excellens*, Latin.) 1. Of great virtue, worth, or dignity (*Taylor*). 2. Eminent in any good quality (*Job*).

E'XCELLENTLY. *ad.* 1. Well; in a high degree (*Brown*). 2. To an eminent degree (*Dryden*).

EXCENTRIC, or EXCENTRIC CIRCLE, in the ancient Ptolemaic astronomy, was the orbit of the planet itself, which it was supposed to describe about the earth, and which was conceived excentric thereto; called also the deferent.

EXCENTRIC, or EXCENTRIC CIRCLE, in the new astronomy, is the circle described from the centre of the orbit of a planet, with half the greatest axis as a radius; or it is the circle that circumscribes the elliptic orbit of the planet.

EXCENTRIC ANOMALY. See ANOMALY.

EXCENTRIC PLACE OF A PLANET, in its orbit, is the heliocentric place, or that in which it appears as seen from the sun.

EXCENTRIC PLACE IN THE ECLIPTIC, is the point of the ecliptic to which the planet is referred as viewed from the sun; and which coincides with the heliocentric longitude.

EXCENTRICITY. See ECCENTRICITY.

EXCENTRICITY, in the old astronomy, is the distance between the centre of a planet and that of the earth.

EXCENTRICITY, in the new astronomy, is the distance between the sun and the centre of a planet's orbit: called also the simple or single excentricity.

Excentricities of the Planets at the commencement of 1801; *the semi-axis major of each orbit being expressed by unity.*

Mercury	0·20551494
Venus	0·00685298
The Earth . . .	0·01683518
Mars	0·09313400
Jupiter	0·04817840
Saturn	0·05616830
Uranus, or Herschel .	0·04667030

Secular Variations of Excentricities: all positive.

Mercury	0·000003867
Venus	0·000062711
The Earth	0·000041632
Mars	0·000090176
Jupiter	0·000159350
Saturn	0·000312402
Uranus	0·000025072

The excentricity of the moon's orbit is 0·0548553; the semi-axis major being unity.

Excentricities of the Orbits of the Telescopic Planets.

Ceres (discovered 1801) . .	0·0783486
Pallas (. . . 1802) . .	0·245384
Juno (. . . 1803) . .	0·254944
Vesta (. . . 1807) . .	0·093220

(*Laplace Mecanique Celeste, and Supplement.*)

The excentricity of a planet being added to the mean distance, gives the greatest distance; or, taken from the mean distance, leaves the least distance of the planet from the sun.

To EXCE'PT. *v. a.* (*excipio*, Latin.) To leave out, and specify as left out of a general precept, or position (*Corinthians*).

To EXCE'PT. *v. n.* To object; to make objections (*Locke*).

EXCE'PT. *preposit.* (from the verb.) 1. Exclusively of; without inclusion of (*Milton*). 2. Unless; if it be not so that (*Tillotson*).

EXCE'PTING. *preposit.* Without inclusion of; without exception of (*Dryden*).

EXCE'PTION. (*s. exceptio*, Latin.) 1. Exclusion from the things comprehended in a precept, or position (*South*). 2. Thing excepted, or specified in exception. 3. Objection; cavil (*Bentley*). 4. Peevish dislike; offence taken (*Bacon*).

EXCE'PTIONABLE. *a.* (from *exception.*) Liable to objection (*Addison*).

EXCE'PTIOUS. *a.* (from *except.*) Peevish; froward; full of objections (*South*).

EXCE'PTIVE. *a.* (from *except.*) Including an exception (*Watts*)

EXCE'PTLESS. *a.* (from *except.*) Omitting or neglecting all exceptions (*Shakspeare*).

EXCE'PTOR. *s.* (from *except.*) Objector (*Burton*).

To EXCE'RN. *v. a.* (*excerno*, Latin.) To strain out; to separate or emit by strainers (*Bacon*).

EXCE'RPTION. *s.* (*excerptio*, Lat.) The act of gleaning or selecting. 2. The thing gleaned or selected.

EXCE'SS. *s.* (*excessus*, Latin.) 1. More than enough; superfluity (*Hooker*). 2. Exuberance; state of exceeding (*Newton*). 3. Intemperance; unreasonable indulgence in meat and drink (*Duppa*). 4. Violence of passion. 5. Transgression of due limits (*Denham*).

Excess (Spherical), in trigonometry, the excess of the sum of the three angles of any spherical triangle, above two right angles. Let A,B,C, be the angles of a spherical triangle, *a,b,c*, the sides opposite to the angles A,B,C, respectively, π = two right angles, r = the radius of a great circle of the sphere, and R'' the number of seconds comprized in radius; then the spherical excess may be ascertained by the following elegant theorem, first given by Simon Lhuillier of Geneva:

$$\text{Tan. } \tfrac{1}{4}\,(A+B+C-\pi) = \frac{1}{r}\sqrt{\left(\text{tan. } \frac{a+b+c}{4}\ \text{tan. } \frac{a+b-c}{4}\ \text{tan. } \frac{a+c-b}{4}\ \text{tan. } \frac{b+c-a}{4}\right)}.$$

M. Puissant gives the following theorems for ε the excess:

$$\varepsilon = \tfrac{1}{2}\left(\frac{R''}{2r^2}\right) a^2 \text{ sin. } 2C + \tfrac{1}{2}\left(\frac{R''}{2r^2}\right) c^2 \text{ sin. } 2A.$$

$$\varepsilon = \tfrac{1}{2}\left(\frac{R''}{r^2}\right) bh,$$ where b = the base, and h = the height of the triangle. It will hence be easy to form a table, from which the spherical excess of any triangle measured may be learnt from its base and height.

EXCE'SSIVE. *a.* (*excessif*, French.) 1. Beyond the common proportion of quantity or bulk (*Bacon*). 2. Vehement beyond measure in kindness or dislike (*Hayward*).

EXCE'SSIVELY. *ad.* Exceedingly; eminently; in a great degree (*Addison*).

To EXCHA'NGE. *v. a.* (*exchanger*, Fr.) 1. To give or quit one thing for the sake of gaining another (*Locke*). 2. To give and take reciprocally (*Rowe*).

Exchange. *s.* (from the verb.) 1. The act of giving and receiving reciprocally (*Waller*). 2. Traffic by permutation (*South*). 3. The form or act of transferring (*Shakspeare*). 4. The balance of the money of different nations (*Hayward*). 5. The thing given in return for something received (*Locke*). 6. The thing received in return for something given (*Dryden*). See the article immediately following.

Exchange (Permutation.) In commerce, an agreement, whereby one thing is trucked or given for another. The first commerce carried on among men, was by exchange; people furnished each other mutually with what things they wanted; but such exchanges were clogged with two considerable difficulties. 1. On account of the unequal values of commodities; and, 2. Because every body had not just what might accommodate the person with whom he would exchange. To remove these inconveniencies, money was invented for a common medium; and instead of exchanging, buying and selling were introduced. Yet there are nations among whom the primitive way of exchange still obtains; and even among the most civilized people, there are frequent occasions, in which they have recourse to this method. Such, for instance, is the trade of several cities of the North, and Baltic sea, where the French exchange their wines and brandies for woods, metals, hemp, and furs.

The commerce of bills of exchange is, itself, a mere trading by exchange; a truck of money for money. Exchange, therefore, properly denotes the business or trade of money, as carried on between one place and another, by means of bills of exchange, i. e. by giving money in one city, and receiving a bill to entitle the giver to receive the value in another city. See **Bill of exchange.**

In professor Beckmann's history of inventions the reader will find an ordinance of the year 1394, concerning the acceptance of bills of exchange, and also copies of two bills of the year 1404, which sufficiently prove that the method of transacting business by bills of exchange was fully established in Europe so early as the fourteenth century; and that the present form and terms were even then used. The ordinance, which was issued by the city of Barcelona, decreed that bills of exchange should be accepted within twenty-four hours after they were presented, and that the acceptance should be written on the back of the bill.

There is also another species, called dry exchange, *cambium siccum*, or usurer's exchange, which consists in giving money at one place, to be repaid it after a certain time in the same place, with a certain sum over, which is usually more than common interest. The ceremony of a real exchange is observed in this fictitious kind, which is only a method of borrowing money. The borrower draws a bill of exchange on any imaginary person, perhaps at Amsterdam, at the price the exchange then goes at, and delivers it to the lender. After the time fixed, comes a protest from Amsterdam for non-payment, with the re-exchange of the money from thence to London; all which, with costs, besides a deduction perhaps at the making of the bargain, the borrower must pay.

Exchange is also used for the profit which a merchant, negociant, or broker makes of a sum of money received, and for which a bill of exchange is drawn, payable in some other place, and by some other person, for the interest of his money, and the reward of his negociation. This profit is exceedingly various; being sometimes 2, sometimes 3, 4, or even 10 and 15 per cent, according as the alloy of the species differs, or as money is more or less plentiful, or bills of exchange more or less scarce, in the places. This kind is ordinarily called real exchange, and sometimes mercantile or mixed exchange.

Exchange is sometimes used for the agio, or difference between the current money or cash, and the exchange, or bank money. Sometimes again, it is used to denote the difference between the par of exchange (or the intrinsic value of the money of one country in coin of another), and the course of exchange (or the value agreed upon by merchants, or their factors). In this sense the exchange is continually fluctuating.

Exchange, in arithmetic, is the reduction of different coins, or any denominations of money, whether there be real coins answering to them, or no, from one to another: or the method of finding how many of one species, or denomination, are equal in value to a given number of another; in order to which it is necessary to know the value of the coins and monies of account of different countries, and their proportion to each other according to the settled rate of exchange. The several operations in this case are only different applications of the rule of three. See *Hutton's* and *Keith's Arith.*

Exchange (Arbitration of). See **Arbitration.**

Exchange signifies also a place in most considerable trading cities, wherein the merchants, agents, bankers, brokers, and other persons concerned in commerce, meet on certain days, and at certain times thereof, to confer and treat together of matters relating to exchanges, remittances, payments, assurances, freights, and other mercantile negociations, both by sea and land.

In Flanders, Holland, and several cities of France, these places are called burses; at Paris and Lyons, places de change; and in the Hanse towns, colleges of merchants. The most considerable exchanges in Europe are, that of Amsterdam, that of London, called the Royal Exchange, and that of Manchester.

EXCHA'NGER. *s.* (from *exchange.*) One who practises exchange (*Locke*).

EXCHE'AT. *s.* See **Escheat** (*Spenser*).

EXCHE'ATOR. *s.* See **Escheator.** (*Car.*)

EXCHEQUER, in the British jurisprudence, an ancient court of record, in which all causes concerning the revenues and rights of the crown are heard and determined, and where the crown revenues are received. It took its name from the chequered cloth which covered the table of the court.

This court is said to have been erected by William the Conqueror, its model being taken from a like court established in Normandy long before that time. Anciently its authority was so great, that it was held in the king's palace, and the acts thereof were not to be examined or controlled in any other of the king's courts; but, at present, it is the last of the four courts at Westminster.

The exchequer, for the despatch of business, is generally divided into two parts; one of which is chiefly conversant in the judicial hearing and deciding of all causes relating to the king's coffers, formerly termed the exchequer of accounts: the other is called the receipt of the exchequer, as being principally employed in receiving and paying of money.

The judicial part of the exchequer is a court both of law and equity. The court of law is held in the office of pleas, according to the course of common law, before the barons: in this court, the plaintiff ought to be a debtor or accountant to the king; and the leading process is either a writ of subpœna, or quo minus, which last goes into Wales, where no process out of courts of law ought to run, except a capias utlagatum.

The court of equity is held in the exchequer chamber before the treasurer, chancellor, and barons; but, generally, before the barons only: the lord chief baron being the chief judge to hear and determine all causes. The proceedings in this part of the exchequer are by English bill and answer, according to the practice of the court of chancery; with this difference, that the plaintiff here must set forth that he is a debtor to the king, whether he be so or not. It is in this court of equity that the clergy exhibit bills for the recovery of their tythes, &c.

But, besides the business relating to debtors, farmers, receivers, accountants, &c. all penal punishments, intrusion, and forfeitures upon popular actions, are matters likewise cognizable by this court; where there also sits a puisne-baron who administers the oaths to high sheriffs, bailiffs, auditors, receivers, collectors, comptrollers, surveyors, and searchers of all the customs, &c. The exchequer in Scotland has the same privileges and jurisdiction as that of England; and all matters competent to the one are competent to the other also.

Barons, and *Chancellor of the* **Exchequer.** See **Barons** and **Chancellor.**

Exchequer-bills are a species of paper first established in 1696, to supply the want of circulating cash, during the re-coinage at that period. They were then taken at the exchequer for all payments of the revenue, and, when re-issued, they were allowed 7*l.* 12*s.* per cent. interest. They have since been issued yearly, and the bank of England, ever since the year 1706, have been the contractors for their circulation, at a certain premium. The commissioners of the treasury are empowered, by various statutes, to borrow money, within a specific sum, limited by those statutes, by issuing exchequer bills on the credit of certain duties; which bills, by 12 Anne, cap. 11. and 12 Geo. I. cap. 11. bear an interest of 2*d*. a day per cent. payable to the bearers. These bills are numbered arithmetically, and registered accordingly, so that the principal sums may be paid off in course, and the interest shall be payable every three months. The said exchequer bills shall be current to all receivers and collectors of the customs, excise, or any revenue, and at the receipt of the exchequer.

If any exchequer bills be lost, upon affidavit before a baron of the exchequer, and certificate from him, and security given to pay the same if found, duplicates are to be made out; and when bills are defaced, new ones shall be delivered. Forging of these bills, or of the indorsements on them, is felony.

The sum of 2,750,000*l*. is usually raised by exchequer bills on credit of the malt tax, and tax on personal estates, although it is well known that these taxes never produce so much, the deficiency being always made good out of the next supplies. The sum to be issued out of the produce of the consolidated fund is likewise usually raised by these bills, charged upon the growing produce of the surplus of the said fund; also other sums for ordinary and extraordinary expences, by bills charged upon the first supplies of the next session; so that of late years the total amount of outstanding exchequer bills has usually been about ten millions. The bank, since 1706, have contracted with government for the circulation of these bills at a certain premium. The interest they carry has been at various rates, from 7*l*. 12*s*. to 3 per cent.; those at present in circulation bear interest at the rate of threepence halfpenny a day per cent. which is computed up to the day of sale, from the respective dates of the bills. They are generally for 100*l*. each, but many of those issued on the vote of credit are for 1000*l*. and they have sometimes been made out for much larger sums: they are numbered arithmetically, and registered accordingly, for the purpose of paying them off in a regular course. They are paid at the exchequer bill office, and the time of payment is notified by advertisement.

The daily transactions between the bank and the exchequer are chiefly carried on by bills of 1000*l*. each, which are deposited by the bank in the exchequer to the amount of the sums received by them on government account: the banknotes and cash thus received by the bank being retained by them, as the detail part of the money-concerns of government is all transacted at the bank. The instalments on loans are paid into the receipt of the exchequer by these exchequer bills of 1000*l*. each, which are received again by the bank as cash, either for the amount of dividends due, or in re-payments of advances; and as, while deposited in the exchequer, they are considered merely as a pledge or security, they of course continue to bear interest, till the advance on which the bank first received them is paid off.

In October, 1796, the 5 per cent. exchequer bills, issued on the vote of credit, being at a considerable discount, it was thought proper to fund them; and the terms agreed upon were as follows:—The holders to be entitled for every 100*l*. to either of the following capitals:

£.	s.	d.	
176	19	9¾	in the 3 per cents.
137	18	7¼	in the 4 per cents.
118	6	10¼	in the 5 per cents.

The amount of the bills thus funded was 1,433,870*l*. and the capital stock created in the different funds, 2,374,333*l*. 14*s*. 8*d*.

In November, 1801, it was again found necessary to fund a considerable part of the outstanding exchequer bills, which was effected on the following conditions: for each 100*l*. principal to receive the under-mentioned proportions of stock:

		Estimated value.		
£.		£.	s.	d.
25	Three per cent. consols	17	1	10¼
25	Three per cent. reduced	16	16	10½
50	Four per cent. consols	42	7	6
25	New 5 per cents	24	15	0
	1*s*. 9*d*. Long annuity	1	14	4
		£. 102	15	7

And the proprietors to have the liberty of subscribing 50*l*. additional in money for every 100*l*. they held in bills, the money thus raised to be applied in paying off the sum of about 2,400,000*l*. in exchequer bills in the possession of the bank. The amount of the bills funded and redeemed was 8,910,450*l*.

As there is always a considerable sum outstanding in exchequer bills, the interest paid thereon forms a constant addition to the annual charge of the funded debt; the amount paid for interest on exchequer bills in the years 1803, 1804, and 1805, respectively, was as follows:

	£.	s.	d.
1803	801,787	10	5½
1804	624,859	18	10
1805	1,478,316	3	3½

The premium or discount at which exchequer bills sell, depends on the proportion which the interest payable on them bears to the interest produced by the public funds according to their current prices.

Exchequer bills, though the same in their nature and solidity, differ in their origin from navy bills in this, that they are issued in anticipation of revenue, and circulated by the bank of England to raise money. During the recess of parliament, there is a sum left to the credit of the chancellor of the exchequer, to serve in cases of exigency. The bank makes advances to the amount voted, for which the exchequer issues bills. There is a standing contract between government and the bank for the trouble and expence attending the issue and circulation of these bills. (*Chambers*, *Fairman*, *Fortune*, *Gregory*, *Grellier*).

***Black book of the* EXCHEQUER**, a book containing a description of the court of England in 1175, and its officers, with their ranks, privileges, wages, &c. also the revenues of the crown, both in money and cattle.

EXCISE, from the Belgic *accüsse*, tributum, tribute, an inland duty or imposition, paid sometimes upon the consumption of a commodity, or frequently upon the wholesale, which is the last stage before the consumption. This is doubtless, impartially speaking, the most economical way of taxing the subject; the charges of levying, collecting, and managing the excise duties, being considerably less in proportion than in other branches of the revenue. It also renders the commodity cheaper to the consumer, than charging it with customs to the same amount would do; for the reason just now given, because generally paid in a much later stage of it. But at the same time, the rigour and arbitrary proceedings of excise laws seem hardly compatible with the temper of a free nation. For the frauds that might be committed in this branch of the revenue, unless a strict watch is kept, make it necessary, wherever it is established, to give the officers a power of entering and searching the houses of such as deal in excisable commodities, at any hour of the day, and, in many cases, of the night likewise. And the proceedings, in case of transgressions, are so summary and sudden, that a man may be convicted in two days time in the penalty of many thousand pounds, by two commissioners or justices of the peace; to the exclusion of the trial by jury, and disregard of the common law. For these reasons, though lord Clarendon tells us, that to his knowledge the earl of Bedford (who was made lord treasurer by king Charles I. to oblige his parliament) intended to have set up the excise in England, yet it never made a part of that unfortunate prince's revenue; being first introduced, on the model of the Dutch prototype, by the parliament itself after its rupture with the crown. Yet such was the opinion of its general unpopularity, that when in 1642 aspersions were cast by malignant persons upon the house of commons, that they intended to introduce excises, the house for its vindication therein did declare, that these rumours were false and scandalous, and that their authors should be apprehended and brought to condign punishment. Its original establishment was in 1643, and its progress was gradual; being at first laid upon those persons and commodities where it was supposed the hardship would be least perceivable, viz. the makers and venders of beer, ale, cyder, and perry; and the royalists at Oxford soon followed the example of their brethren at Westminster, by imposing a similar duty: both sides protesting, that it should be continued no longer than to the end of the war, and then be utterly abolished. But the parliament at Westminster soon after imposed it on flesh, wine, tobacco, sugar, and such a multitude of other commodities, that it might be fairly denominated general: in pursuance of the plan laid down by Mr. Pymme (who seems to have been the father of the excise), in his letter to sir John Hotham, signifying, that they had proceeded in the excise to many particulars, and intended to go on farther; but that it would be necessary to use the people to it by little and little. And afterwards, when the nation had been accustomed to it for a series of years, the succeeding champions of liberty boldly and openly declared the impost of excise to be the most easy and productive levy that could be laid upon the people; and accordingly continued it during the whole usurpation. Upon king Charles's return, it having then been long established and its produce well known, some part of it was given to the crown, in 12 Car. II. by way of purchase for the feudal tenures and other oppressive parts of the hereditary revenue. But, from its first original to the present time, its very name has been odious to the people. It has, nevertheless, been imposed on abundance of other commodities in the reigns of king William III. and every succeeding prince, to support the enormous expences occasioned by our wars on the continent. Thus brandies and other spirits are now excised at the distillery; printed cottons and linens, at the printers; starch and hair powder, at the maker's; gold and silver wire, at the wiredrawer's; all plate whatsoever, first in the hands of the vender, who pays yearly for a licence to sell it, and afterwards in the hands of the occupier, who also pays an annual duty for having it in his custody; and coaches and other wheel carriages, for which the occupier is excised; though not with the same circumstances of arbitrary strictness with regard to plate and coaches as in the other instances. To these we may add coffee and tea, chocolate and cocoa paste, for which the duty is paid by the retailer; all artificial wines, commonly called sweets; paper and pasteboard, first when made, and again if stained or printed; malt, as before mentioned; vinegars; and the manufacture of glass; for all which the duty is paid by the manufacturer; hops, for which the person that gathers them is answerable; candles and soap, which are paid for at the maker's; malt liquors brewed for sale, which are excised at the brewery; cyder and perry at the venders; leather and skins, at the tanner's; and, lately, tobacco, at the manufacturer's: a list, which no friend to his country would wish to see farther increased.

The excise was formerly farmed out; but is now managed for the king by commissioners in both kingdoms, who receive the whole product of the excise, and pay it into the exchequer. These commissioners are nine in number in England, and five in Scotland. The former have a salary of 1000*l.* a year, the latter 600*l.* They are obliged by oath to take no fee or reward but from the king himself; and from them there lies an appeal to five other commissioners called commissioners of appeals.

Total gross produce of the Excise Duties in England, in the year ending the 5th of January, 1807.

	l.	s.	d.
Auctions	249,891	14	1¼
Beer and ale	2,971,351	15	7¼
Bricks and tiles	306,061	10	0¼
Candles	311,449	4	8
Cocoa-nuts and coffee	124,178	5	7½
Cyder and perry	19,772	5	1¾
Glass	424,786	3	9¾
Hides and skins	311,322	17	1
Hops	56,339	15	2½
Licences	301,083	17	11¼
Malt	1,388,130	8	8¼
Metheglin, or mead	161	8	9
Paper	359,158	5	5½
Printed goods	698,373	17	8
Salt	1,470,704	13	2¼
Soap	586,564	5	7½
Spirits, British	1,201,200	19	11
Ditto, Foreign	1,772,866	14	5¼
Starch	60,025	14	0¼
Sweets	24,771	0	6¼
Tea	1,280,751	16	8½
Tobacco and snuff	196,188	10	10¼
Vinegar and verjuice	38,024	14	7½
Wine	1,149,313	8	7¼
Wire	13,338	9	11
WAR TAXES.			
Wine	210,292	7	3¼
Malt	2,713,172	10	8¼
Spirits, British and foreign	1,473,936	6	11¼
Sweets	4,483	12	3¼
Tea	1,313,664	12	7¼
Tobacco and snuff	162,342	18	10½
ANNUAL DUTIES.			
Old malt duty	676,810	12	0¾
Additional malt duty	1,115,491	1	9
Tobacco and snuff	428,140	4	9¼
Total £.	23,414,796	6	7¼

The balance of cash at the commencement of the year being 27,790*l.* 3*s.* 3¼*d.* added to the above sum, makes the total to be accounted for 23,442,586*l.* 9*s.* 11*d.* This amount is subject to various deductions, consisting principally of the expences of management, drawbacks of duty on goods exported, allowances and bounties on several commodities, annual payments to the officers of the late wine licence office and of the old salt duties, and pensions granted by patent out of the excise while it formed part of the hereditary revenue of the crown. The amount of these payments in the year ending the 5th of January, 1807, was as follows:

	l.	s.	d.
Charges of Management	569,341	0	4¼
Taxes repaid to officers	30 513	15	8¼
Exports	920,712	3	10
Allowances	69,242	5	11¼
Bounties	20,304	19	5¼
Overcharges, overpayments, repayments per treasury warrant, &c.	29,701	15	0¼
Payments to officers of late wine licence office and salt duties	10,599	4	5¼
Pensions to the duke of Grafton and others	14,000	0	0
Payments into the exchequer	21,739,067	12	10
Balance of cash remaining the 5th of January, 1807, carried to the next year's account	39,103	12	3½
Total £.	23,442,586	9	11

The total gross produce of the excise duties in Scotland, in the above year, was 1,824,394*l.* 0*s.* 6½*d.*; of which the sum of 1,445,000*l.* was paid into the exchequer during the year. The total gross produce of the excise duties in Ireland, for the same year, was 1,453,500*l.* 0*s.* 2*d.* (*Brit. Ency.*).

EXCISE LAWS. For more easily levying the revenue of the excise, the kingdom of England and Wales is divided into about fifty collections, some of which are called by the names of particular counties, others by the names of great towns; where one county is divided into several collections, or where a collection comprehends the contiguous parts of several counties, every such collection is subdivided into several districts, within which there is a supervisor; and each district is again subdivided into outrides and footwalks, within each of which there is a gauger or surveying officer.

The commissioners or sub-commissioners, in their respective circuits and divisions, shall constitute, under their hands and seals, so many gaugers as they shall find needful.

Arrears of duties.—By several acts of parliament, all articles in the possession of persons subject to the excise laws, together with all the materials and utensils of whatsoever description, are made liable for the arrears of duties, whether these be single or double duties; and if a trader, being in arrears for the single duties, becomes a bankrupt, and is convicted after the assignment of his effects, the double duties are a lien upon the exciseable commodities, utensils, and materials in the hands of his assignees, and the commissioners or magistrates may authorize the penalty to be levied upon all such commodities, and all the materials, preparations, utensils, and vessels for making thereof, in the custody of the bankrupt, or any person or persons in trust for him. 2 *Doug.* 411.

Bonds, for the exportation of exciseable commodities, are to be taken by officers of excise, and they are to be given generally upon all exciseable articles, at the place where exported.

Forgery of any stamps, licences, certificates, permits, or any other excise documents, is by various statutes made a capital felony.

Licences.—In all cases where licences are required, the licence will only sanction the business carried on in that particular place for which such licence was granted; but when the business is carried on by partners, one licence will be sufficient to cover the firm.

Officers of excise.—The officers of excise are to be appointed, and may be dismissed, replaced, or altered, by the commissioners, under their hands and seals; their salaries are allowed and established by the treasury; and by 1 W. & M. c. 24. s. 15. if it is proved by two witnesses, that any officer has demanded or taken any money, or other reward whatever, except of the king, such offender shall forfeit his office.

By several statutes, no process can be sued out against any officer of excise, for any act done in the execution of his office, until one month after notice given, specifying the cause of action, and the name and abode of the person who is to begin, and the attorney who is to conduct the action; and within one month after such notice, the officer may tender amends, and plead such tender in bar; and having tendered insufficient or no amends, he may, with leave of the court, before issue joined, pay money into court.

Officers of excise are empowered to search, at all times of the day, entered warehouses, or places for tea, coffee, &c. But private houses can only be searched upon oath of the suspicion before a commissioner or justice of peace, who can by their warrant authorize a search.

Permits.—Persons dealing in exciseable commodities are entitled to permits for removing the same to different places in certain quantities, and under certain regulations. These permits are written upon a peculiar species of paper, manufactured expressly for the purpose; and by 23 Geo. III. c. 70. s 11. no permit paper is to be delivered out before it shall be filled up agreeably to the request note of a trader; and officers knowingly granting any false permit, making false entries in the counterpart thereof, or receiving any commodities into stock with a false or forged permit, are to be transported for seven years.

Samples.—Officers of excise are, by various acts, empowered to take samples of exciseable commodities, paying the prices therein regulated for the same.

Seizures.—When an officer makes a seizure of any spirits, or other articles, he must lay his hand on the casks, vessels, &c. so seized, and declare that he seizes such spirits, &c. and the casks or vessels containing the same, for the use of his majesty and of himself; but if the officer happens to be alone when he makes such seizure, he must afterwards, in the presence of witnesses, again lay his hand on such cask, vessel, &c. and repeat the former declaration of seizure.

All informations on seizures must be laid in the names of the officers making the same.

By 41 Geo. III. c. 96. commissioners of excise are empowered to make restitution of exciseable goods.

Scales and weights.—By various acts of parliament, traders subject to the excise laws are to keep just and sufficient scales and weights, under the penalty of 100*l.* for every such offence, and the scales and weights may be seized by the officers.

Traders, manufacturers, and dealers liable to the excise duties, are to assist the officers in weighing stock; and forcibly obstructing, or using any art or contrivance to prevent or impede the officers from taking a true account, incurs a penalty of 100*l.* (*Gregory's Dict.*)

To EXCI'SE. *v. a.* (from the noun.) To levy excise upon a person or thing (*Pope*).

EXCI'SEMAN. *s.* An officer who inspects commodities, and rates their excise.

EXCI'SION. *s.* (*excisio*, Latin.) Extirpation; destruction; ruin (*Decay of Piety*).

EXCITABILITY. EXCITEMENT. In medicine, terms almost peculiar to the Brunonian system. (See BRUNONIAN SYSTEM.) In all the states of life, observes Dr. Brown, man and other animals differ from themselves in their dead state, or from any other inanimate matter, in this property alone; they can be affected by external agents, as well as by certain functions peculiar to themselves, in such a manner, that the phænomena peculiar to the living state can be produced. This proposition extends to every thing that is vital in nature, and therefore applies to vegetables.

The external agents are reducible to heat, diet, and other substances taken into the stomach, blood, the fluids secreted from the body and air.

The functions of the system itself, producing the same effect, are muscular contraction, sense, or perception, and the energy of the brain in thinking, and in exciting passion and emotion. These affect the system in the same manner as the other agents; and they arise both from the other and from themselves.

If the property which distinguishes living from dead matter, or the operation of either of the two sets of powers be withdrawn, life ceases. Nothing else than the presence of these is necessary to life.

The property on which both sets of powers act may be named excitability, and the powers themselves exciting powers. By the word body is meant, both the body simply so called, and also as endued with an intellectual part, a part appropriated to passion and emotion, or a soul: the usual appellation in medical writings is system.

The effects common to all the exciting powers are, sense, motion, mental exertion, and passion. Now their effects being the same, it must be granted that the operation of all the powers is the same.

The effects of the exciting powers acting upon the excitability may be denominated *excitement*.

The excitability of the whole body, therefore, as well as of particular parts, is supposed to be in a state of perpetual variation, depending upon the time and manner of application of the internal and external stimuli employed; and the cure upon this theory consists in proportioning the stimuli to the degree of excitability present in the patient till healthy excitement is restored.

EXCITA'TION. *s.* (from *excito*, Latin.) 1. The act of exciting, or putting into mo-ſion (*Bacon*). 2. The act of rousing or awakening (*Watts*).

To EXCI'TE. *v. a.* (*excito*, Latin.) 1. To rouse; to animate; to stir up; to encourage (*Spenser*). 2. To put into motion; to raise.

EXCI'TEMENT. *s.* (from *excite.*) The motive by which one is stirred up (*Shakspeare*).

EXCI'TER. *s.* (from *excite.*) 1. One that stirs up others, or puts them in motion (*King Charles*). 2. The cause by which any thing is raised or put in motion (*Decay of Piety.*)

EXCI'TING CAUSE. In medicine. Occasional cause. Procatarctic cause. Remote cause. That which, when applied to the body under a state of predisposition, excites a disease. The exciting or remote causes of diseases are either external or internal.

To EXCLA'IM. *v. a.* (*exclamo*, Latin.) 1. To cry out with vehemence; to make an outcry (*Decay of Piety.*) 2. To declare with loud vociferation (*Shakspeare*).

Excla'im. *s.* (from the verb.) Clamour; outcry: not used (*Shakspeare*).

EXCLA'IMER. *s.* (from *exclaim.*) One that makes vehement outcries (*Atterbury*).

EXCLAMATION *s.* (*exclamatio*, Lat.) 1. Vehement outcry; clamour; outrageous vociferation (*Hooker*). 2. An emphatical utterance (*Sidney*). 3. A note by which a pathetical sentence is marked thus!.

Exclamation. In rhetoric, a figure that expresses the violent and sudden breaking out and vehemence of any passion. Such is that in the second book of Milton's Paradise Lost:

> O unexpected stroke, worse than of death!
> Must I thus leave thee, Paradise? Thus leave
> Thee, native soil; these happy walks and shades,
> Fit haunt of gods?

EXCLA'MATORY. *a.* (from *exclaim.*) 1. Practising exclamation. 2. Containing exclamation.

To EXCLU'DE. *v. a.* (*excludo*, Latin.) 1. To shut out; to hinder from entrance or admission (*Dryden*). 2. To debar; to hinder from participation; to prohibit (*Dryden*). 3. To expect in any position. 4. Not to comprehend in any grant or privilege (*Hooker*). 5. To dismiss from the womb or egg (*Brown.*)

EXCLU'SION. *s.* (from *exclude.*) 1. The act of shutting out or denying admission (*Bacon*). 2. Rejection; not reception (*Addison*). 3. The act of debarring from any privilege 4. Exception (*Bacon*). 5. The dismission of the young from the egg or womb (*Ray*). 6. Ejection; emission; thing emitted (*Brown*).

Exclusion, or Bill of exclusion, a bill proposed about the close of the reign of king Charles II. for excluding the duke of York, the king's brother, from the throne, on account of his being a papist,

Exclusion, in mathematics, is a method of coming at the solution of numerical problems, by previously throwing out of our consideration such numbers as are of no use in solving the question.

EXCLU'SIVE. *a.* (from *exclude.*) 1. Having the power of excluding or denying admission (*Milton*). 2. Debarring from participation (*Locke*). 3. Not taking into any account or number. 4. Excepting.

EXCLU'SIVELY. *ad.* 1. Without admission of another to participation (*Boyle*). 2. Without comprehension in an account or number; not inclusively (*Ayliffe*).

To EXCO'CT. *v. a.* (*excoctus*, Latin.) To boil up; to make by boiling (*Bacon*).

EXCŒCA'RIA. In botany, a genus of the class dioecia, order triandria. Ament naked, covered with florets; calyxless; corolless. Fem styles three; capsules three-grained; seeds solitary. There are two species, e. agollocha, and e. cochinchinensis.

The agallochum, which is known by the name of aloe-wood, or the aromatic aloe, is one of the most valuable spices imported from the East, and has been in high estimation, even in the earliest ages. According to the different species of the plant, it is called *lignum aloes*, *agallochi veri*, *aquilæ*, and *calambac*, all of which differ remarkably in their sensible properties. It is, however, very difficult to ascertain the botanical character of these various species.

The aromatic wood of aloe is properly a resin, which has pervaded the pores of the tree. The genuine sort of this resinous wood is as precious as gold, and is used only by the great and affluent in the East Indies, China, and Japan, as an agreeable perfume, with which they fumigate houses: hence it is but rarely imported into Europe. It is black, and variegated with grey veins, swims on water, and if strongly rubbed on glass, leaves behind resinous particles, which neither water, saliva, expressed oils, nor an alkaline lye, but spirit of wine only will dissolve and remove. Its odour is very grateful.

This substance has, in former times, been much used as a medicine, not only in biliary complaints, diseases of the liver and stomach, and dysentery, but likewise as a remedy for the maw-worm; but at present it is entirely neglected—a revolution to which several of the ancient remedies have been subject, and which is likely to take place with many of the modern.

Father De Loureiro assures us, that he discovered in the province of Cochin-China the tree which affords the true aloe. This aromatic wood is found in resinous masses, only in old half-decayed, hollow trees. According to this writer, the tree belongs, in the system of Linnéus, to the first division of the tenth class, the decandria monogynia: he called it *aloexylum agallochum*. It grows on the highest mountains of Chochin-China, on the banks of the river Lay, which flows through the whole of that province. Loureiro had no opportunity of seeing the blossoms on the tree; he could only once obtain them dried, and transmitted by a friend, so that the parts of fructification were much bruised and lacerated on a long journey, and he could with difficulty give the following description :—

Aloexylum agallochum. Differ. spec. aloe. foliis lanceolatis, alternis: pedunculis polyfloris, terminalibus.

Hab. Arbor magna: trunco et ramis erectis, altissimis: cortice cannabino, fusco, glabro, nec crasso.

Folia lanceolata, octo polyces longa, integerrima, plana, glabra, subcoriacea, alterna, petiolata. Flos terminalis, pedunculis polyfloris.

Usus. Ligni hujus suffimenta inter omnia maxime æstimantur apud nationes Orientales. Ex arboris cortice fit vulgaris charta, in quâ Conchin-chinenses scribunt, sicut in Japonia fit ex cortice mori.

Virtus medica. Excitans, corroborans, cephalica, cardiaca. Suffitus valet contra vertiginem et paralysin. Pulvis cohibet vomitum et fluxus ventris, præcipue lientricos, quod non proprie astringendo, sed corroborando agit.

This tree is not of a poisonous nature, and yields no milky sap when perforated. With respect to the genuine wood of aloe, Loureiro maintains that the various species differ remarkably, both in colour and flavour. By some botanists, this aromatic wood has been confounded with the lignum aquilæ, which is likewise esteemed for its agreeable odour, and, like the agallochum verum, calambac, and garo de Malacca, affords different species of perfume.

To EXCO'GITATE *v. a.* (*excogito*, Lat.) To invent: to strike out by thinking (*More*).

EXCOMMU'NICABLE. *a.* Liable or deserving to be excommunicated (*Hooker*).

To EXCOMMU'NICATE. *v. a.* (*excommunico*, Lat.) To eject from the communion of the church by an ecclesiastical censure (*Ham.*).

EXCOMMUNICATION, an anathema, or ecclesiastical censure, and punishment; whereby a heretic is cut off from the society of the faithful, or an obstinate sinner from the communion of the church, and the participation of the sacraments.

This censure of excommunication was originally instituted for preserving the purity of the church; but ambitious ecclesiastics converted it by degrees into an engine for promoting their own power, and inflicted it on the most frivolous occasions.

The power of excommunication properly belongs to the bishop; but he may delegate it to any grave priest, with the chancellor.

Every excommunication should be preceded by three public admonitions, two days at least distant from each other; but this is to be understood of excommunications imposed by the ecclesiastical judge; for those imposed by the law are incurred to all intents and purposes the moment the action is committed.

These latter are called excommunications by the canon, or *latæ sententiæ*; and are so very numerous, that it would be difficult, even for the best canonists, to give an exact list of them; there are fifty in the Clementines; twenty in the bull Cœna Domini, &c. Wilkins's Mag. Conc. vol. iv. p. 664. Rebuffe, on the Concordat, reckons up sixty penalties accruing upon excommunication.

Excommunication is founded on a natural right which all societies have, of excluding out of their body such as violate the laws thereof.

Excommunication is either *major* or *minor*, i. e. greater or less; the first, which is that understood when we say, simply, excommunication, separates or cuts off the delinquent from all communication and fellowship with other Christians; disables him from defending his rights, bringing an action at law, be a witness, &c. The second, or lesser, only excludes from the communion of the Lord's supper.

The greater excommunication, called also *ab homine*, is when a prelate, or his deputy, excommunicates any man personally, and interdicts him all society with the faithful, all use of sacraments, &c.

In the ancient church, the sentences of the greater excommunication were solemnly promulged four times in the year, with candles lighted, bells tolling, the cross, and other solemnities.

The lesser excommunication is incurred *pleno jure*, by having any communication with a person excommunicated in the greater excommunication. And this too imports a privation of communion, but not an interdiction from entering the church, nor having commerce with the faithful.

Anciently, the excommunicated were obliged to procure absolution from their bishop, and make satisfaction to the church, in forty days time; otherwise they were compelled to it by the secular judge, by a seizure of their effects, imprisonment of their persons, &c.

Excommunication, among the pagans, excluded the persons from the sacrifices and the temples, and delivered them over to the Furies, which was called *execrare*, and *Diris devovere*. When Marcus Crassus set out on his expedition against the Parthians, Atteius, tribune of the people, not being able to prevent him, ran to the gate of the city through which the general was to pass, and setting a chafing-dish in the middle of the way with fire in it, when Crassus drew near, he threw some perfumes into the chafing-dish, and pronounced curses against Crassus with great exclamation, and thus excommunicated him.

Excommunication, in the church of England, is the highest ecclesiastical censure which can be pronounced by a spiritual judge against a christian: for thereby he is excluded from the body of the church, and disabled to bring any action, or sue any person in the common law courts. Co. Lit. 133.

The sentence of excommunication was instituted originally for preserving the purity of the church; and it seems agreed, that wherever the spiritual court has jurisdiction in any cause, and the party refuses to appear to their citation, or after sentence, being admonished to obey their decree, that he may be excommunicated. 1 Rol. Abr. 883.

A person excommunicated is disabled to be a witness in any cause: he cannot be attorney or procurator for another; he is to be turned out of the church by the church-warden, and not to be allowed christian burial. Gibs. Cod. 435.

The sentence of excommunication can only be pronounced by the bishop, or other person in holy orders, being a master of arts at least; also the priest's name pronouncing such sentence, is to be expressed in the instrument issuing under seal out of the court. Gibs. Cod. 1095.

EXCO'MMUNICATO CAPIENDO, or SIGNIFICAVIT, a writ directed to the sheriff, for the apprehension of one who stands obstinately excommunicated the space of forty days. Such a one, not seeking absolution, hath, or may have, his contempt certified into the chancery; whence this writ issues for laying him up, without bail or mainprize, until he conform himself.

EXCOMMUNICATO DELIBERANDO, is a writ directed to the under sheriff, for the delivery of an excommunicated person out of prison; upon certificate of the ordinary of his conformity to the ecclesiastical jurisdiction.

EXCOMMUNICATO RECIPIENDO, is a writ whereby persons excommunicated, being for their obstinacy committed to prison, and unlawfully delivered from thence before they have given security to obey the authority of the church, are commanded to be sought for, and laid up again.

To EXCO'RIATE. *v. a.* To flay; to strip off the skin (*Wiseman*).

EXCORIATION. (*excoriatio*, from *excorio*, to take off the skin.) An abrasion of the skin.

EXCORIATION is also sometimes used to signify the act of flaying: and figuratively to denote plunder or spoil.

EXCORTICA'TION. *s.* (from *ex* and *cortex*, Latin.) Pulling the bark off any thing (*Quincy*).

To E'XCREATE. *v. a.* (*excreo*, Latin,) To eject at the mouth by hawking.

EXCREMENT. (from *excerno*, to separate from.) Whatever is separated or excreted from the blood as useless, as well as the remnants of those substances, both animal and vegetable, which after having undergone the process of digestion, and supplied the body with nourishment, are only retained till there is an opportunity or a necessity for evacuating them, may be denominated excrement.

Excrements are found in a fluid or a solid state. The first comprehends the urine and sweat: the second the feces. Between the first two a great analogy has been found to exist, and in many cases they are perceived mutually to answer the same purposes. Fewer experiments, however, have been made upon the matter of perspiration than upon urine. Like the latter it appears to be loaded with salts of various kinds, and to tinge linen with different shades of yellow. Berthollet affirms that it reddens blue paper, and that this effect is produced more particularly from that which is produced from those parts affected with gout: he thinks it contains phosporic acid; and Hershall saw a person whose body, during perspiration, was become phosphorescent.

Human urine is peculiarly characterised by its possession of lithic acid, an acid secreted by the kidneys of no other animal than man; and which, when in large quantity, usually crystallizes round the sides of the vessel in which it is deposited, in the form of red polygonal salts, vulgarly denominated red sand. It contains also a large quantity of extractive matter of a peculiar kind, denominated by the French chemists *urée*; and a considerable portion of phosphoric acid. The urine of animals that feed on vegetables alone is proved by Fourcroy to contain benzoic acid instead of phosphoric, but to hold a larger portion of extractive matter.

This extractive matter is applied to a promotion of the arts in various ways, but chiefly in the four following. 1. The artificial formation of nitre. 2. The scouring of woollen cloths. 3. The extraction of ammonia. 4. The extraction of muriat of ammonia. For the rest, see URINE.

With respect to the feces, the cupidity of the alchemists was excited by some wild dreams of being able to extract from this substance an oil capable of fixing mercury (the first step to its supposed conversion into gold;) and hence many experiments were undertaken upon human feces, into which subject we shall not enter. Homberg, one of the most respectable of this tribe, made very numerous experiments; one of the results of which was a discovery of the pyrophorus, which bears his name, and which is now obtained by a perfectly unoffensive process.

The dung of different animals is employed for a variety of important purposes. That of the herbivorous quadrupeds appears a mixture of bile and animal fluids, with a considerable portion of the fibrous or least digestible part of vegetable food. Hence the great use of camels dung in Arabia and Egypt as fuel, being the chief and almost the only substance procurable for the purpose. A considerable quantity of ammonia is always produced by the burning of dung, from which, mixed with sea-salt, the earliest sal-ammoniac was obtained. Cow-dung is of no small use in a number of processes for the preparation of cloth either for dyeing or bleaching. It mixes uniformly with water, and possesses cleansing powers similar to those of soap. The feces of dogs and carnivorous animals are distinguished by their excessively offensive smell, and the extremely corroding effect which they have upon organized matter when the putrid fermentation is established. This excrement is used in the preparation of leather by tawing, as it is called, and its effect is first to loosen and destroy the adhesion of the hair, then to render the whole skin extremely flexible and open in texture;

and if the process be continued only a few hours too long, the whole consistence of the skin will be destroyed, and it will fall to pieces like a mucilaginous jelly. If the process of analysis were less repulsive, an examination into the properties of this powerful agent would prove highly interesting.

EXCREME'NTAL. *a.* (from *excrement.*) That is voided as excrement (*Raleigh*).

EXCREMENTI'TIOUS. *a.* (from *excrement.*) Containing excrements; consisting of matter excreted from the body (*Bacon*).

EXCRE'SCENCE. Excre'scency. *s.* (*excresco*, Lat.) Somewhat growing out of another without use, and contrary to the common order of production (*Bentley*).

Excre'scence. (*excrescentia*, from *excresco*, to grow from.) In surgery. Any preternatural formation of flesh, or other part of the body, as wens, warts, &c.

EXCRE'SCENT. *a* (*excrescens*, Latin.) That grows out of another with preternatural superfluity (*Pope*).

EXCRE'TION. (*excretio*, from *excerno*, to separate from.) This term is applied to the separation or secretion of those fluids from the blood of an animal, that are supposed to be useless, as the urine, perspiration, and alvine fæx.

EXCRE'TIVE. *a.* (*excretus*, Latin.) Having the power of separating and ejecting excrements (*Harvey*).

E'XCRETORY. *a.* (from *excretion.*) Having the quality of separating and ejecting superfluous parts.

E'xcretory. *s.* The duct or instrument of excretion. See Anatomy.

EXCRU'CIABLE. *a.* (from *excruciate.*) Liable to torment.

To EXCRU'CIATE. *v. a.* (*excrutio*, Lat.) To torture; to torment (*Chapman*).

EXCUBA'TION. *s.* (*excubatio*, Latin.) The act of watching all night.

EXCUBIÆ. In antiquity, the watches and guards kept in the day by the Roman soldiers. They are contradistinguished from the *Vigiliæ*, which are kept in the night.

To EXCU'LPATE. *v. a.* (*ex* and *culpo*, Lat.) To clear from the imputation of a fault (*Clar*).

EXCU'RSION. *s.* (*excursion*, French.) 1. The act of deviating from the stated or settled path; a ramble (*Pope*). 2. An expedition into some distant part (*Locke*). 3. Progression beyond fixed limits (*Arbuth*). 4. Digression; ramble from a subject (*Boyle*).

EXCU'RSIVE. *a.* (from *excurro*, Latin.) Rambling; wandering; deviating (*Thomson*).

EXCU'SABLE. *a.* (from *excuse.*) Pardonable; that may be excused (*Tillotson*).

EXCU'SABLENESS. *s.* (from *excusable.*) Pardonableness; capability to be excused (*Boyle*).

EXCUSATI. In church history, a term used to denote slaves, who flying to any church for sanctuary, were excused and pardoned by their masters; but these were obliged to take an oath to that purpose before they could have them again; and, if they broke the oath, they were punished and fined as persons guilty of perjury.

EXCU'SATION. *s.* (from *excuse.*) Excuse; plea; apology (*Bacon*).

EXCU'SATORY. *a.* (from *excuse.*) Pleading excuse; apologetical; making apology.

To EXCU'SE. *v. a.* (*excuso*, Latin.) 1. To extenuate by apology (*Ben Jonson*). 2. To disengage from an obligation (*Clarend.*). 3. To remit; not to exact. 4. To weaken or molify obligation to any thing; to obtain remission (*South*). 5. To pardon by allowing an apology (*Addis.*). 6. To throw off imputation by a feigned apology (*Corinthians*).

Excu'se. *s.* (from the verb.) 1. Plea offered in extenuation; apology (*Sid.*). 2. The act of excusing or apologizing (*Shak.*). 3. Cause for which one is excused (*Roscom.*).

EXCU'SELESS. *a.* (from *excuse.*) That for which no excuse can be given (*Decay of Piety*).

EXCU'SER. *s.* (from *excuse.*) 1. One who pleads for another (*Swift*). 2. One who forgives another.

To EXCU'SS. *v. a.* (*excussus*, Latin.) To seize and detain by law (*Ayliffe*).

EXCU'SSION. *s.* (*excussio*, Lat.) Seizure by law.

E'XECRABLE. *a.* (*execrabilis*, Lat.) Hateful; detestable; accursed (*Hooker*).

E'XECRABLY. *ad.* (from *execrable.*) Cursedly; abominably (*Dryden*).

To E'XECRATE. *v. a.* (*execror*, Latin.) To curse; to imprecate ill upon (*Temple*).

EXECRA'TION. *s.* (from *execrate.*) Curse; imprecation of evil (*Stillingfleet*).—At the taking and demolishing of a city, it was frequent to pronounce direful curses and execrations upon any person who should endeavour to rebuild it.

To EXE'CT. *v. a.* (*execo*, Lat.) To cut out; to cut away (*Harvey*).

EXE'CTION. *s.* (from *exect.*) The act of cutting out.

To E'XECUTE. *v. a.* (*exequor*, Latin.) 1. To perform; to practise (*South*). 2. To put in act; to do what is planned or determined (*Locke*). 3. To put to death according to form of justice; to punish capitally (*Davies*). 4. To put to death; to kill (*Shaksp.*).

EXECUTER. *s.* (from *execute.*) 1. He that performs or executes any thing (*Shaksp.*). 2. He that is intrusted to perform the will of a testator. In this sense the accent is on the second syllable (*Shakspeare*). 3. An executioner; one who puts others to death: not used (*Shakspeare*).

EXE'CUTERSHIP. *s.* (from *executer.*) The office of him that is appointed to perform the will of the defunct (*Bacon*).

EXECU'TION. *s.* (from *execute.*) 1. Performance; practice (*Bacon*). 2. The last act of the law in civil causes, by which possession is given of body or goods. 3. Capital punishment; death inflicted by forms of law (*Creech*). 4. Destruction; slaughter (*Hayward*).

Execution. In law, the completing or

finishing some act, as of judgment, deed, &c. and it usually signifies the obtaining possession of any thing recovered by judgment of law.

Sir Edward Coke observes, that there are two sorts of executions: the one final, and the other *a quousque*, that tends to an end. An execution final, is that which makes money of the defendant's goods; or extends to his lands, and delivers them to the plaintiff, who accepts the same in satisfaction; and this is the end of the suit, and the whole that the king's writ requires to be done. The writ of execution with a *quousque*, though it tends to an end, yet is not final, as in the case of a *capias ad satisfac.* where the defendant's body is to be taken, in order that the plaintiff may be satisfied for his debt. See Capias.

Executions are either in personal, real, or mixed actions. In a personal action, the execution may be made three ways, viz. by the writ of *capias ad satisfaciendum*, against the body of the defendant; *fieri facias*, against his goods; or *elegit*, against his lands.

In a real and mixed action, the execution is by writ of *habere facias sasinam*, and *habere possessionem*. See Habere. Writs of execution bind the property of goods only from the time of delivery of the writ to the sheriff; but the land is bound from the day of the judgment obtained; and here the sale of any goods for valuable consideration, after a judgment, and before the execution awarded, will be good. It is otherwise as to lands, of which execution may be made, even on a purchase after the judgment, though the defendant sell such land before execution. Likewise, sheriffs may deliver in execution all the lands whereof others shall be seized in trust for him against whom execution is had on a judgment, &c.

When any judgment is signed, the execution may be taken out immediately thereon; but if it be not issued within a year and a day after, where there is no fault in the defendant, as in the case of an injunction, writ of error, &c. there must be a *scire facias*, to revive the judgment; though, if the plaintiff sues out any writ of execution within the year, he may continue it after the year is expired. After judgment against the defendant, in an action wherein special bail is given, the plaintiff is at liberty to have execution against such defendant, or against his bail: but this is understood where the defendant does not render himself, according to law, in safeguard of the bail; and execution may not regularly be sued forth against a bail, till a default is returned against the principal: also if the plaintiff takes the bail, he shall never take the principal. It is held that an execution may be executed after the death of the defendant; for his executor, being privy thereto, is liable as well as the testator. The execution is an entire thing, so that he who begins must end it: therefore, a new sheriff may distrain an old one, to sell the goods seized on a distringas, and to bring the money into court.

Execution, in criminal cases, the completion of human punishment. This follows judgment; and must in all cases, capital as well as otherwise, be performed by the legal officer, the sheriff or his deputy: execution of criminals, must be according to the judgment; and the king cannot alter a judgment from hanging to beheading, because no execution can be warranted, unless it be pursuant to the judgment. Murderers are to be executed the day next but one after conviction, unless it be Sunday, and anatomized; for which reason they are generally tried on a Friday.

Execution, in music, is sometimes particularly used to express a facility of voice or finger in running rapid divisions, and other intricate parts.

EXECUTIONER. *s.* (from *execution.*) 1. He that puts in act, or executes (*Shakspeare*) 2. He that inflicts capital punishments (*Sid.*). 3. He that kills; he that murders (*Shaksp.*). 4. The instrument by which any thing is performed (*Crashaw*).

EXECUTIVE. *a.* (from *execute.*) 1. Having the quality of executing or performing (*Hale*). 2. Active; not deliberate; not legislative; having the power to put in act the laws (*Swift*).

EXECUTOR, is a person appointed by the testator, to carry into execution his will and testament after his decease. The regular mode of appointing an executor is by naming him expressly in the will: but any words indicating an intention of the testator to appoint an executor will be deemed a sufficient appointment.

Any person capable of making a will, is also capable of being an executor: but in some cases, persons who are incapable of making a will may nevertheless act as executors, as infants, or married women; to obviate, however, inconveniencies which have occurred respecting the former, it is enacted by stat. 38 Geo. III. c. 89, that where an infant is sole executor, administration, with the will annexed, shall be granted to the guardian of such infant, or such other person as the spiritual court shall think fit, until such infant shall have attained the age of twenty-one; when, and not before, probate of the will shall be granted him.

An executor derives his authority from the will and not from the probate, and is therefore authorized to do many acts in execution of the will, even before it is proved, such as releasing, paying, or receiving of debts, assenting to licenses, &c. but he cannot proceed until he has obtained probate.

If an executor dies before probate, administration must be taken out with the will annexed; but if an executor dies, his executor will be executor to the first testator, and no fresh probate will be needed. It will be sufficient if one only of the executors prove the will; but if all refuse to prove, they cannot afterwards administer, or in any respect act as executors.

If an executor becomes a bankrupt, the

court of chancery will appoint a receiver of the testator's effects, as it will also upon the application of a creditor if he appears to be wasting the assets.

If an executor once administers, he cannot afterwards renounce; and the ordinary may in such case issue process to compel him to prove the will. 1 Mod. 213.

If an executor refuses to take upon him the execution of the will, he shall lose the legacy therein contained.

If a creditor constitutes his debtor his executor, this is at law a discharge of the debt, whether the executor acts or not, provided however there be assets sufficient to discharge the debts of the testator.

The first duty of an executor or administrator is to bury the deceased in a suitable manner; and if the executor exceeds what is necessary in this respect, it will be a waste of the substance of the testator.

The next thing to be done by the executor is to prove the will, which may be done either in the common form, by taking the oath to make due distribution, &c. or in a more solemn mode, by witnesses to its execution.

By stat. 37 Geo. III. c. 9. s. 10. every person who shall administer the personal estate of any person dying, without proving the will of the deceased, or taking out letters of administration within six calendar months after such person's decease, shall forfeit 50*l*.

Upon proving the will, the original is to be deposited in the registry of the ordinary, by whom a copy is made upon parchment under his seal, and delivered to the executor or administrator, together with a certificate of its having been proved before him, and this is termed the probate.

If all the goods of the deceased lie within the same jurisdiction, the probate is to be made before the ordinary or bishop of the diocese, where the deceased resided; but if he had goods and chattels to the value of 5l. in two distinct dioceses or jurisdictions, the will must be proved before the metropolitan or archbishop of the province in which the deceased died. An executor, by virtue of the will of the testator, has an interest in all the goods and chattels, whether real or personal, in possession or in action of the deceased; and all goods and effects coming to his hands will be the assets to make him chargeable to creditors and legatees. An executor or administrator stands personally responsible for the due discharge of his duty; if, therefore, the property of the deceased be lost, or through his wilful negligence become otherwise irrecoverable, he will be liable to make it good; and also where he retains money in his hands longer than is necessary, he will be chargeable not only with the interest but costs, if any have been incurred.

But one executor shall not be answerable for money received, or detriment occasioned by the other, unless it has been by some act done between them jointly. An executor or administrator has the same remedy for recovering debts and duties, as the deceased would have had if living. Neither an executor nor administrator can maintain any action for a personal injury done to the deceased, when such injury is of such a nature for which damages may be received; in actions, however, which have their origin in breach of promise, although the suit may abate by the death of the party, yet it may be revived either by his executors or administrators, who may also sue for rent in arrear, and due to the deceased in his life-time. By the custom of merchants, an executor or administrator may indorse over a bill of exchange, or promissory note. An executor or administrator may also, on the death of a lessee for years, assign over the lease, and shall not be answerable for rent after such assignment, nor shall he be liable for rent due after the lessee's death, from premises which in his life-time he had assigned to another.

An executor, or administrator, is bound only by such covenants in a lease as are said to run with the land. The executor, or administrator, previous to the distribution of the property of the deceased, must take an inventory of all his goods and chattels, which must, if required, be delivered to the ordinary upon oath. He must then collect, with all possible convenience, all the goods and effects contained in such an inventory; and whatever is so recovered that is of a saleable nature, and can be converted into money, is termed assets, and makes him responsible to such amount to the creditors, legatees, and kindred of the deceased.

The executor, or administrator, having collected in the property, is to proceed to discharge the debts of the deceased, which he must do according to the following priorities, otherwise he will be personally responsible 1. Funeral expences, charges of proving the will, and other expenditures incurred by the execution of his trust. 2. Debts due to the king on record, or by speciality. 3. Debts due by particular statutes, as by 30 Geo. II. c. 23. forfeitures for not burying in woollen, money due for poor-rates, and money due to the post-office. 4. Debts of record, as judgments, statutes, recognizances, and those recognized by a decree of a court of equity, and debts due on mortgage. 5. Debts on special contract, as bonds, or rather instruments under seal; and also rent in arrear. 6. Debts on simple contract, viz. such as debts arising by mere verbal promise, or by writing not under seal, as notes of hand, servants' wages, &c.

The executor is bound at his peril to take notice of debts on record, but not of other special contracts, unless he receives notice.

If no suit is actually commenced against an executor or administrator, he may pay one creditor in equal degree the whole debt, though there should be insufficient remaining to pay the rest; and even after the commencement of a suit, he may, by confessing judgment to other creditors of the same degree, give them a preference.

Executors and administrators are also allowed, amongst debts of equal degree, to pay themselves first: but they are not allowed to retain their own debt, to the prejudice of others in a higher degree; neither shall they be permitted to retain their own debts, in preference to that of their co-executor or co-administrator of equal degree, but both shall be charged in equal proportion.

A mortgage made by the testator must be discharged by the representative out of the personal estate, if there is sufficient to pay the rest of the creditors and legatees. Where such mortgage, however, was not incurred by the deceased, it is not payable out of the personal estate. See Legacies, and Assets.

Executor de son tort, or an executor of his own wrong, a person that takes upon him the office of an executor by intrusion, without being so constituted by the testator, or appointed by the ordinary to administer. Such a person is chargeable to the rightful executor, as also to all the testator's creditors and legatees, so far as the goods amount which he wrongfully possessed.

EXECUTORY ESTATE. Estates executory, are when they pass presently to the person to whom conveyed, without any after-act, 2 Inst. 513; and leases for years, rents, annuities, conditions, &c. are called inheritances executory. Id. 293.

Executory devise, is defined a future interest, which cannot vest at the death of a testator, but depends upon some contingency, which must happen before it can vest: it is called so to distinguish it from a remainder from which it differs in being less strictly restrained by technical rules.

EXE'CUTRIX. *s.* (from *execute.*) A woman intrusted to perform the will of the testator.

EXEDRÆ, in antiquity, halls with many seats, where the philosophers and men of learning met for discourse and disputation.

EXEGESIS, or Exegetica, in algebra, is the finding of the roots of equations, either in the numbers or lines, according as the problem is numeral or geometrical.

EXEGE'TICAL. *a.* (ἐξηγητικός.) Explanatory; expository (*Walker*)

EXE'MPLAR. *s.* (*exemplar*, Lat.) A pattern; an example to be imitated (*Raleigh*).

EXE'MPLARILY. *ad.* (from *exemplary.*) 1. So as deserves imitation (*Howel*). 2. So as may warn others (*Clarendon*).

EXE'MPLARINESS. *s.* State of standing as a pattern to be copied (*Tillotson*).

EXE'MPLARY. *a.* (from *exemplar.*) 1. Such as may deserve to be proposed to imitation (*Bacon*). 2. Such as may give warning to others (*K. Charles*). 3. Such as may attract notice and imitation (*Prior*).

EXEMPLIFICA'TION. *s.* (from *exemplify*) A copy; a transcript.

Exemplification of letters patent, a transcript or duplicate of them, made from their enrolment, and sealed with the great seal. These exemplifications are by statute equally effectual, and may be pleaded as well as the originals. One may exemplify a patent under the great seal in chancery; also any record or judgment in any of the courts at Westminster, under the seal of each court; which exemplifications may be given in evidence to a jury. It is held, that nothing but matter of record ought to be exemplified.

To EXE'MPLIFY. *v. a.* (from *exemplar.*) 1. To illustrate by example (*Hooker*). 2. To transcribe; to copy.

To EXE'MPT. *v. a.* (*exemptus*, Latin.) To privilege; to grant immunity from (*Knolles*).

Exe'mpt. *a.* (from the verb.) 1. Free by privilege (*Ayliffe*). 2. Not subject; not liable to (*Ben Jonson*). 3. Clear; not included (*Lee*). 4. Cut off from: not used (*Shak.*).

EXE'MPTION. *s.* (from *exempt.*) Immunity; privilege; freedom from imposts (*Bacon*).

EXEMPTI'TIOUS. *a.* (from *exemptus*, Latin.) Separable; that may be taken from another (*More*).

To EXE'NTERATE. *v. a.* (*exentero*, Lat.) To embowel (*Brown*).

EXENTERA'TION. *s.* (*exenteratio*, Lat.) The act of taking out the bowels (*Brown*).

EXE'QUIAL. *a.* (from *exequiæ*, Latin.) Funeral; relating to funerals.

E'XEQUIES. *s.* Without a singular. (*exequiæ*, Latin.) Funeral rites; the ceremony of burial; the procession of burial (*Dryden*).

EXE'RCENT. *a.* (*exercens*, Latin.) Practising; following any calling (*Ayliffe*).

E'XERCISE. *a.* (*exercitium*, Latin.) Labour of the body; labour considered as conducive to health (*Bacon*). 2. Something done for amusement (*Bacon*). 3. Habitual action by which the body is formed to gracefulness (*Sidney*). 4. Preparatory practice in order to skill. 5. Use; actual application of any thing (*Hooker*). 6. Practice; outward performance (*Addison*). 7. Employment (*Locke*). 8. Task; that which one is appointed to perform (*Milton*). 9. Act of divine worship whether public or private (*Shakspeare*).

Upon some of these meanings we think it necessary to enlarge, as below.

Exercise, among physicians, such an agitation of the body as produces salutary effects in the animal economy. Those exercises of the body are more especially serviceable which give delight to the mind at the same time, as tennis, fencing, &c.; for which reason, the wisdom of antiquity appointed rewards for those who excelled in these gymnastic exercises, that by this means the bodies of their youth might be hardened for warlike toils. But as nothing is more conducive to health than moderate exercise, so violent exercise lowers the spirits, weakens the body, destroys the elasticity of the fibres, and exhausts the fluid parts of the blood. According to the strength of the party using it, the exercise chosen should be either active, such as walking, hunting, dancing, &c. or passive, as riding in a coach or on horseback, sailing, &c. A very eligible sort of exercise for consumptive persons is swinging, from whence very striking good effects have in some instances been produced. In this case the motion should be very gently applied, and the patient placed so securely as to feel no apprehensions of falling.

The exercise of a soldier in camp, considered as conducive to health, Dr. Pringle distinguishes into three heads; the first relating to his duty, the second to his living more commodiously, and the third to his diversions. The first, consisting chiefly in the exercise of his arms, will be no less the means of preserving health than of making him expert in his duty: and frequent returns of this, early, and before the sun grows hot, will be made more advantageous than repeating it seldom, and staying out long at a time; for a camp affording little convenience for refreshment, all unnecessary fatigue is to be avoided. As to the second article, cutting boughs for shading the tents, making trenches round them for carrying off the water, airing the straw, cleaning their clothes and accoutrements, and assisting in the business of the mess, ought to be no disagreeable exercise to the men for some part of the day. Lastly, as to diversions, the men must be encouraged to them either by the example of their officers, or by small premiums to those who shall excel in such kind of sports as shall be judged most conducive to health: but herein great caution is necessary, not to allow them to fatigue themselves too much, especially in hot weather or sickly times: but above all, that their clothes be kept dry, wet clothes being the most frequent cause of camp-diseases.

EXERCISE OF ANIMALS, generally, that kind of bodily exertion which they use spontaneously, according to the share of activity naturally belonging to them; or to which it may be necessary to urge them, for the preservation of their health. Almost all domestic animals require the stimulus of exercise, but especially those that are distinguished for their fleetness, and of all others the horse. Such of these animals as stand too much at rest, are at the same time full fed, and breathe constantly a hot, foul, stagnated air in close stables, cannot, it is well known, be long preserved in a proper habit of body, or remain fit for active service to their owners. In order that they may perform the labour expected from them with ease and freedom to themselves, and with pleasure to their riders, it is the interest of the latter to attend very particularly to this important article.

There is no veterinary writer who has done greater justice to this interesting subject than Mr. Clark. This author asserts, that a much greater number of horses which are high fed, and stand inactive in close warm stables, die of diseases arising from the want of regular exercise, than from any other cause whatever.

Horses, says he, are formed for labour: inactivity, however, with full feeding, renders the body dull and sluggish. The stomach is loaded with food, which it cannot properly digest; the food is detained too long in the bowels: hence indigestion, costiveness, and flatulencies. The intestines, in this loaded state, press upon the surrounding viscera, and obstruct the circulation of the different fluids in them. The liver, mesentery, and spleen, are exposed to be injured from this cause; their natural functions are impeded; the animal economy is disturbed: and when this is the case, the constitution cannot but be injured, and diseases ensue. The natural secretions are not in due quantity: they, together with the perspiration, are retained in the body, and are absorbed or taken up again into the mass of humours; and hence arises another source of disease. The circulation of blood through the whole system is slow and languid: hence the humours or juices are not properly prepared; glandular obstructions are formed in different organs of the body; the sheath and legs swell; running sores take place in the latter, commonly called grease; and the whole mass of fluids is greatly disposed to putrefaction: diseases follow, and death frequently concludes the scene.

On the other hand, constant and habitual exercise renders the body strong and active, and, at the same time, fit for the most violent exertions of strength; it assists the heart in promoting a free circulation of the blood and juices through every part of the body; it creates an appetite, and promotes digestion, and thereby greatly assists in converting the food to nourishment; it promotes all the secretions and excretions, which enlivens the body, and gives room for fresh supplies of nourishment; it invigorates the whole system; it gives a flow of spirits, and adds firmness and strength to the muscles and sinews. In short, without a certain proportion of exercise no animal body can enjoy health.

The effects of exercise to horses, however, are not limited to the preservation of their health; but, in many cases of incipient disease, its good effects likewise soon become visible. For instance, when it is used as a medicine in those horses that have swelled legs, &c. from standing idle in the stable: for although such horses may have been declared full of humours, and that nothing could relieve them from these supposed humours but purging, diuretic, or alterative medicines, yet it has been frequently found, that regular exercise, frequent rubbing of the legs (which is topical exercise), with a roomy stall to stretch their legs when they lie down, have removed these complaints without any medicine whatever being administered.

In great towns, rides or covered ways, for exercising horses in all weathers, are extremely useful; and no stable-yard, in a large town, should be without one; although, at the same time, the open air is preferable.

From what has been said, it may be inferred, that they should be accustomed to exercise by degrees; for all sudden changes, whether from idleness to active exercise, or from exercise to idleness, produce considerable changes in the system, and render both the solids and fluids liable to disease. This we experience from our own feelings; and it is the same with horses on their being first set to hard labour, or violent exercises, although they cannot express their uneasy sensations except by their stiff and contracted steps, which may be observed upon moving them about after a hard day's work. We should accustom them, therefore, gradually and regularly to exercise or labour; and it then becomes easy to them, nor will any stiffness or difficulty of breathing follow from it. When a horse has arrived at this state or habit of body, he is then said, in the stable phrase, to be in wind.

But one great source of disease in horses arises from the improper treatment of them after they have been overheated by labour. Although a horse be all over wet and smoking with sweat, still ignorant grooms and hostlers will insist, according to their own way of expressing themselves, that he is not heated at heart, and will rashly expose him to the cold air uncovered, tied at the stable-door, and even allow him to drink his belly-full of cold water in this condition. Mr. Clark observes, that it would fill a volume to enumerate the cases that have occurred where this treatment has proved fatal to horses By being exposed to cold air, or drinking cold water, the blood-vessels contract suddenly (for it is the same, in effect, whether cold be applied to the internal organs, as the stomach or lungs, or to the external surface of the body), and hence violent inflammation of the lungs or other vital parts, gangrene, &c. and all the well-known diseases that are consequent upon obstructed perspiration. Death indeed is frequently the consequence, or the horse so treated is seized with the most violent acute diseases. To avoid these consequences, we should not only resist the evil practices alluded to, but be careful, in hunting, where it is necessary to ride through rivers or pits, to do it with as much caution as the case will admit. Indeed, every one who has a regard for his horse, will, when the animal is in a profuse sweat, if possible, endeavour to shun these entirely, or go to a part where the water is less deep, or to a bridge, although it may be at a considerable distance: for, otherwise, the sudden cold will either not only endanger the creature's life, from the most violent acute diseases which will probably occur, or, if he survive the shock, the most obstinate chronic complaints in the chest, legs, and feet, destroy his constitution, and may render him totally useless.

It is to be observed, however, that, like many other things relating to horses, exercise, given for the mere purposes of health, may be carried to excess, and, consequently, may prove rather hurtful than beneficial; therefore the time and manner of regulating it deserves attention. Thus, it would be imprudent to cause a horse to exert himself too suddenly after he is newly fed and watered, because his stomach is then too full. Horses, in this case, should be made to move slowly and gently at first setting out. They will naturally mend their pace of themselves. Their exercise should be continued in proportion to their strength, manner of feeding, and the labour, &c. required of them; and this should not only be repeated every day when it is practicable, but increased as circumstances may require. From not attending to the above precautions in exercising horses, how many are the cases of broken wind, and other asthmatic complaints, which have occurred?

It is likewise improper to take out horses to exercise in wet or rain, or when they are not able to bear it, either from former fatigue, from hard labour, or when they are sick or lame.

But still greater caution is necessary to be observed with regard to horses that are very fat. These require a long course of very moderate and regular exercise before they can with safety be put to that which is the least violent. The want of attention to this circumstance frequently occasions sudden death; many instances of which Mr. Clark says he has known, particularly in horses that have been fed with a great deal of boiled meat, in order to fatten them for sale. Thus a pair of strong heavy carriage-horses, he says, were once offered him for sale: he declined purchasing them, on account of their extreme fatness; which was thought a very singular reason. A gentleman in the neighbourhood, however, who was not so scrupulous, purchased them, and they were exercised with the greatest care and attention for a considerable time, in order to bring them into a proper condition for work. After some weeks, they had occasion to travel pretty smartly a very short stage of seven miles out and home, which finished one of them after a short illness. This, and a variety of similar cases, shew the danger of putting horses that are too fat and full of juices, suddenly, on violent exercise of any kind; for there is no state or habit of body a horse can be in more dangerous, or more liable to disease, than that of his being too fat.

Thus it is evident, that, under proper regulation, the greatest advantages arise to horses from the constant habit of exercise. The effects it produces when carried to excess, as is frequently the case in hunting, and still more in contests on the race-course, where the efforts of the horse are often prodigious, are in some cases curious. It has been observed, in animals that have been hard hunted before they were killed, that, upon taking off the skin, the whole panniculus adiposus, and even the muscular parts, have been found almost black, from the blood being extravasated under the skin, or by the extreme heat of the body, together with the velocity of the circulating fluid; and that the blood has been forced into parts in which it does not commonly circulate. The same appearance, Mr. Clark says, he has observed in horses, particularly one that suddenly fell down dead in a race on coming up to the starting-post the last heat. On taking off his skin, the blood appeared as if it had been extravasated between the flesh and the skin, and ran down in a considerable quantity, as the horse was then hardly cold. It is likewise observed, in cattle that are driven too hard immediately before they are slaughtered, that the blood is too much mixed with the flesh, &c. All these circumstances demonstrate, that, in violent exercises, the blood is forced, by the rapidity of the circulation and extreme heat of the body, out of its natural limits.

To the mischievous effects of extreme and unnatural degrees of exercise, such as are here mentioned, together with those which certainly follow, if, while in this heated state, cold water be thrown upon the body of the horse, or if he be plunged into it, Mr. Clark attributes certain diseases, of which we shall treat under their proper heads, but particularly that called the FOUNDER. See that article.

EXERCISE, in military affairs, is the ranging a body of soldiers in form of battle, and making them perform the several motions and military evolutions with different management of their arms, in order to make them expert therein.

EXERCISE, in a naval sense, is the preparatory practice of managing the artillery and small arms, in order to make the ship's crew perfectly skilled therein, so as to direct its execution successively in time of battle. The words of command introduced, during the late war, for the exercise of the great guns, are the following: Silence; cast loose your guns; level your guns; take out your tompions; run out your guns; prime; point your guns; fire; spunge your guns; load with cartridge; shot your guns; put in your tompions; house your guns; and secure your guns.

EXERCISE, may also be applied with propriety to the forming our fleets into orders of sailing, lines of battle, &c. an art which the French have termed *evolutions*, or *tactiques*. In this sense exercise may be defined, the execution of the movements which the different orders and disposition of fleets occasionally require, and which the several ships are directed to perform by means of signals. See TACTICS.

To EXERCISE. *v. a.* (*exerceo*, Latin.) 1. To employ; to engage in employment (*Locke*). 2. To train to use by any act (*Locke*). 3. To make skilful or dexterous by practice; to habituate (*Hebrews*). 4. To busy; to keep busy (*Atterbury*). 5. To task; to keep employed as a penal injunction (*Milton*). 6. To practise; to perform (*Bacon*). 7. To exert; to put in use (*Locke*). 8. To practise or use in order to habitual skill (*Addison*).

To EXERCISE. *v. n.* To use exercise; to labour for health or amusement (*Broome*).

E'XERCISER. *s.* (from *exercise.*) He that directs or uses exercise.

EXERCISES, are also understood of what young gentlemen learn in the academies and riding-schools, such as fencing, drawing, riding the great horse, &c. How useful and agreeable soever study may be to the mind, it is very far from being equally salutary to the body. Every one observes that the Creator has formed an intimate connection between the body and the mind; a perpetual action and reaction, by which the body instantly feels the disorders of the mind, and the mind those of the body. The delicate springs of our frail machines lose their activity and become enervated, and the vessels are liable to obstructions when we totally desist from exercise, and the consequences necessarily affect the brain: a very studious and sedentary life is therefore equally prejudicial to the body and the mind. The limbs likewise become stiff; we contract an awkward constrained manner; a certain disgustful air attends all our actions, and we are very near being as disagreeable to ourselves as to others. An inclination to study is highly commendable; but it ought not, however, to inspire us with an aversion to society. The natural lot of man is to live among his fellows: and whatever may be the condition of our birth, or our situation in life, there are a thousand occasions where a man must naturally desire to render himself agreeable; to be active and adroit; to dance with grace; to command the fiery steed; to defend himself against a brutal enemy; to preserve his life by dexterity; as by leaping, swimming, &c. Many rational causes have therefore given rise to the practice of particular exercises; and the most sagacious and benevolent legislators have instituted, in their academies and universities, proper methods of enabling youth, who devote themselves to study, to become expert also in athletic exercises.

EXERCITATION *s.* (*exercitatio*, Latin.) 1. Exercise (*Brown*). 2. Practice; use (*Felton*).

EXERGUM, a little space around or without the figures of a medal; left for the inscription, device, date, &c.

To EXERT. *v. a.* (*exero*, Latin) 1. To use with an effort (*Rowe*) 2. To put forth; to perform (*South*). 3. To enforce; to push to an effort (*Dryden*). 4. To bring out (*Dryden*). 5. To emit; to push out (*Philips*).

EXERTION. *s.* (from *exert.*) The act of exerting; effort.

EXESION. *s.* (*exesus*, Latin.) The act of eating through (*Brown*).

EXESTUATION. *s.* (*exæstuo*, Latin) The state of boiling; effervescence; ebullition (*Boyle*).

EXETER, (the *Augustar* of the Romans, and the *Exancester* of the Saxons, afterwards abbreviated to *Excester* or Exeter), a city of England, and capital of Devonshire, situated on the river Ex, about ten miles from the English channel; the see of a bishop, suffragan of the archbishop of Canterbury, removed to this city from Crediton, by Edward the Confessor. The city is ancient, probably built at the time the Romans were in possession of Britain; it was surrounded with walls, and had six gates, most of which are pulled down. Besides the cathedral, which is a magnificent pile of building, there are eighteen other churches, a few chapels, and five large meeting-houses. The city is governed by a mayor, recorder, town-clerk, &c. and was incorporated by king John, and erected into a county by Henry VIII. All pleas and civil causes are tried by the mayor, aldermen, recorder, and common-council; criminal causes, and private wrongs, are judged by eight aldermen, who are justices of the peace. In the north-west corner of the city stood the castle, called Rougemont, from the colour of the hill on which it was built, supposed to have been founded by the West Saxon kings, and afterwards made the seat of the earls of Cornwall. Nothing but the outer walls remain. This castle was completely ruined in the civil wars, when the city held out against Fairfax, who blockaded it for two months. The principal public buildings are the guildhall and public hospital. The guildhall is a spacious and convenient building, built in its present form in the year 1593, but repaired in 1720. The public hospital was erected by subscription, in the year 1740, for the sick and lame of the city and county of Devon. The trade of the city of Exeter consists principally in the exportation of coarse woollen goods, manufactured in the counties of Devon, Cornwall, and Somerset; these goods the merchants of Exeter buy rough from the loom, mill, dye, and finish them for use, and afterwards export them; they chiefly consist of druggets, duroys, kerseys, and everlastings. Ships of burden formerly came up to this city; but the navigation was almost destroyed by one of the Courtenays earls of Devon, and, though repaired, in some degree, could never be restored to its former state. The port of Exeter, therefore, is properly at Topsham, five miles below. It is, however, a principal city, for size and consequence, in the W. of England, the residence of many genteel families, and the seat of an extensive foreign and domestic commerce; and, particularly, it has a share in the fisheries of Newfoundland and Greenland. It contains 2836 houses, and 17,398 inhabitants: it is governed by a mayor, recorder, 24 aldermen, &c. and sends two members to parliament. Lat. 50. 44 N. Lon. 3. 33 E.

Exeter is also the name of two towns in North America: the one being in N. Carolina; the other in New Hampshire.

To EXFO'LIATE. *v. n.* (*ex* and *folium*, Latin.) To shell off; to separate, as a corrupt bone from the sound part (*Wiseman*).

EXFOLIA'TION. *s.* (from *exfoliate.*) The process by which the corrupted part of the bone separates from the sound (*Wiseman*).

EXFO'LIATIVE. *a.* (from *exfoliate.*) That has power of procuring exfoliation (*Wiseman*).

EXHA'LABLE. *a.* (from *exhale.*) That may be evaporated (*Boyle*).

EXHALA'TION. *s.* (*exhalatio*, Latin.) 1. The act of exhaling or sending out in vapours; emission. 2. The state of evaporating or flying out in vapours; evaporation. 3. That which rises in vapours (*Milton*).

The terms *exhalation* and *vapour* are ordinarily used indifferently, but the more accurate writers now distinguish them; appropriating the term *vapour* to the moist fumes raised from water and other liquid bodies; and *exhalation* to the dry ones emitted from solid bodies; as earth, fire, minerals, sulphurs, salts, &c. We are not aware, however, that any great advantages have arisen from the distinction: and it is certainly not suggested by the etymology of the word; the Latin verb *exhalo*, from which it is derived, signifying literally to breathe out, or to send forth.

To EXHA'LE. *v. a.* (*exhalo*, Latin.) 1. To send or draw out in vapours (*Temple*). 2. To draw out (*Shakspeare*).

EXHA'LEMENT. *s.* (from *exhale.*) Matter exhaled; vapour (*Brown*).

To EXHA'UST. *v. a.* 1. To drain; to diminish (*Bacon*). 2. To draw out totally; to draw until nothing is left (*Locke*).

EXHAUSTED RECEIVER, a glass, or other vessel, applied on the plate of an air-pump, and having the air extracted out of it by the working of the engine. (See AIR-PUMP.) Things placed in an exhausted receiver, are said to be *in vacuo*. See VACUUM.

EXHA'USTION. *s.* (from *exhaust.*) The act of drawing or draining.

EXHAUSTIONS, or the METHOD OF EXHAUSTIONS, a method of demonstration founded upon a kind of exhausting a quantity by continually taking away certain parts of it.

The method of exhaustions was of frequent use among the ancient mathematicians; as Euclid, Archimedes, &c. It is founded on what Euclid says in the 10th book of his Elements; viz. that those quantities are equal, whose difference is less than any assignable quantity.

This principle is used in the first prop. of the 10th book, which imports, that if from the greater of two quantities be taken more than its half, and from the remainder more than its half, and so on; there will at length remain a quantity less than either of those proposed. On this foundation it is demonstrated, that if a regular polygon of infinite sides be inscribed in a circle, or circumscribed about it; then the space, which is the difference between the circle and the polygon, will by degrees be quite exhausted, and the circle become ultimately equal to the polygon. And in this way it is that Archimedes demonstrates, that a circle is equal to a right-angled triangle, whose two sides about the right angle, are equal, the one to the semidiameter, and the other to the perimeter of the circle. Prop. 1 De Dimensione Circuli.

This kind of demonstration, though attended with strict mathematical evidence, is necessarily prolix: for which reason Cavalerius introduced a shorter method of proof. See INDIVISIBLES.

EXHA'USTLESS. *a.* (from *exhaust.*) Not to be emptied; inexhaustible (*Blackmore*).

To EXHI'BIT. *v. a.* (*exhibeo*, Latin.) 1. To offer to view or use; to offer or propose in a formal manner (*Clarendon*). 2. To show; to display (*Pope*).

EXHI'BITER. *s.* (from *exhibit.*) He that offers any thing in a public manner (*Shakspeare*).

EXHIBI'TION. *s.* (from *exhibit.*) 1. The act of exhibiting; display (*Grew*). 2. Allowance; salary; pension (*Swift*). 3. Payment; recompence (*Shakspeare*).

EXHI'BITIVE. *a.* (from *exhibit.*) Representative; display (*Norris*).

To EXHI'LARATE. *v. a.* (*exhilero*, Lat.) To make cheerful; to cheer; to fill with mirth; to enliven (*Philips*).

EXHILARA'TION. *s.* (from *exhilarate.*) 1. The act of giving gayety. 2. The state of being enlivened (*Bacon*).

To EXHO'RT. *v. a.* (*exhortor*, Latin.) To incite by words to any good action (*Common Prayer*).

EXHORTA'TION. *s.* (from *exhort.*) 1. The act of exhorting; incitement to good (*Atterbury*). 2. The form of words by which one is exhorted (*Shakspeare*).

EXHO'RTATORY. *a.* (from *exhort.*) Tending to exhort.

EXHO'RTER. *s.* One who exhorts.

EXHUMATION. (of *ex*, out of, and *humus*, ground). The act of digging up a body interred in holy ground, by the authority of the judge.

To EXI'CCATE. *v. a.* (*exsicco*, Latin.) To dry.

EXICCA'TION. *s.* (from *exiccate.*) A refaction; act of drying up; state of being dried up (*Bentley*).

EXI'CCATIVE. *a.* (from *exiccate.*) Drying in quality; having the power of drying.

E'XIGENCE. E'xigency. *s.* (from *exigent.*) 1. Demand; want; need (*Atterbury*). 2. Pressing necessity; sudden occasion (*Pope*).

E'XIGENT. *s.* (*exigens*, Latin.) 1. Pressing business; occasion that requires immediate help (*Waller*). 2. (A law term.) A writ sued when the defendant is not to be found. 3. End (*Shakspeare*).

EXIGENTERS, four officers of the court of common pleas, who make all exigents and proclamations, in all actions where the process of outlawry lies.

EXIGU'ITY. *s.* (*exiguitas*, Latin.) Smallness; diminutiveness; slenderness (*Boyle*).

EXI'GUOUS. *a.* (*exiguus*, Latin.) Small; diminutive; little: not used (*Harvey*).

EXILE. 1. Banishment. 2. The person banished.

Among the Romans, the word exile, *exilium*, properly signified an interdiction, or exclusion from water and fire; the necessary consequence of which was, that the interdicted person must betake himself into some other country, since there was no living without fire and water.

Exi'le. *a.* (*exilis*, Latin.) Small; slender; not full; not powerful (*Bacon*).

To E'xile. *v. a.* (from the noun.) To banish; to drive from a country (*Shakspeare*).

EXI'LEMENT. *s.* Banishment (*Wotton*).

EXILI'TION. *s.* (*exilitio*, Latin.) The act of springing out suddenly (*Brown*).

EXI'LITY. *s.* (*exilis*, Latin.) Smallness; slenderness; diminution (*Grew*).

EXILIUM, in law, signifies a spoiling. It is applied to the injury done to tenants, by ejecting them, &c.

EXI'MIOUS. *a.* (*eximius*, Latin.) Famous; eminent; conspicuous; excellent.

EXINANI'TION. *s.* (*exinanitio*, Latin.) Privation; loss (*Decay of Piety*).

To EXI'ST. *v. n.* (*existo*, Latin.) To be; to have a being (*South*).

EXI'STENCE. Exi'stency. *s.* (*existentia*, low Latin.) State of being; actual possession of being. Or existence is that whereby a thing has an actual essence, or is said *to be*, *esse*.

The notion of existence is applicable not only to a created but an uncreated substance: but it must be added, that the existence of created substances, and especially corporeal ones, implies a respect to place, time, and even an efficient cause; whence the schoolmen generally define it, that whereby a thing is formally and extrinsically without (*extra*) its causes, and that here, and now.

Existence and essence come very near the nature of each other; in effect, they only differ in that we have different manners of conceiving the same thing.

For, 1. Essence is usually explained either by the first, noblest, and radical attribute of the thing, e. gr. that of body, by extension; that of mind, by thinking, &c. or by specifying all the intrinsic attributes; and existence, either by specifying all place, and all time, as in that of God; or by specifying some definite place, and time, together with the cause, as in the creatures.

2. The foundation and occasion of this distinction is this; that essence belongs to the question, *What is it? Quid est?* but existence to the question, *Is it? An est?*

3. Existence necessarily pre-supposes essence, and cannot be conceived without it; but essence may be conceived without existence; in that essence belongs equally to things that are in *potentia*, and in *actu*; but existence only to those in *actu*. Note, however, that this does not obtain in God, about whose nature and essence the mind cannot think without conceiving his existence.

We have divers ways of arriving at the knowledge of the existence of things. Our own existence we know by intuition; the existence of a God, by demonstration; and that of other things, by sensation.

As for our own existence, we perceive it so plainly, that it neither needs nor is capable of any proof. *I think, I reason, I feel pleasure and pain:* can any of these be more evident to me than my own existence? If I doubt of all other things, that very doubt makes me perceive my own existence, and will not suffer me to doubt of that. If I know I doubt, I have as certain a perception of the thing doubting, as of that thought which I call doubt. Experience then convinces us, that we have an intuitive knowledge of our own existence, and an internal infallible perception that we are. In every act of sensation, reasoning, or thinking, we are conscious to ourselves of our own being; and in this manner come not short of the highest degree of certainty.

As to our knowledge of the existence of a God, though he has given us no innate ideas of himself, yet, having furnished us with faculties of sense, perception, and reason, we can never want a clear proof thereof. See GOD.

The knowledge of the existence of any other thing, we can have only by sensation: for, there being no necessary connection of real existence with any idea a man hath in his memory; nor of any other existence, but that of God, with the existence of any particular man; no particular man can know the existence of any other being, but only when, by actually operating upon him, it makes itself be perceived by him. The having the idea of any thing in our mind, no more proves the existence of that thing, than the picture of a man evidences his being in the world, or the visions of a dream make thereby a true history. It is therefore the actual receiving of ideas from without, that gives us notice of the existence of other things, and makes us know that something doth exist at that time without us, which causes that idea in us, though perhaps we neither know nor consider how it does it; for it takes not from the certainty of our senses, and the ideas we receive by them, that we know not the manner wherein they are produced. This notice we have by our senses of the existing of things without us, though it be not altogether so certain as intuition and demonstration, deserves the name of knowledge, if we persuade ourselves that our faculties act and inform us right concerning the existence of those objects that affect them. But besides the assurance we have from our senses themselves, that they do not err in the information they give us of the existence of things without us, we have other concurrent reasons: As, 1. It is plain those perceptions are produced in us by exterior causes affecting our senses, because those that want the organs of any sense never can have the ideas belonging to that sense produced in their minds. This is too evident to be doubted; and therefore we cannot but be assured, that they come in by the organs of that sense, and no other way.

Secondly, Because we find sometimes that we cannot avoid the having those ideas produced in our minds. When my eyes are shut, I can with pleasure recal to my mind the ideas of light or the sun, which former sensations had lodged in my memory: but if I turn my eyes towards the sun, I cannot avoid the ideas which the light or the sun then produces in me. Which shews a manifest difference between those ideas laid up in the memory, and such as force themselves upon us and we cannot avoid having. And therefore it must needs be some exterior cause, whose efficacy I cannot resist, that produces those ideas in my mind, whether I will or no. Besides, there is nobody who doth not perceive the difference in himself, between actually looking upon the sun, and contemplating the idea he has of it in his memory; and therefore he hath certain knowledge, that they are not both memory or fancy; but that actual seeing has a cause without.

Thirdly, add to this, that many ideas are produced in us with pain, which we afterwards remember without the least offence. Thus the pain of heat or cold, when the idea of it is received in our minds, gives us no disturbance, which, when felt, was very troublesome; and we remember the pain of hunger, thirst, head-ach, &c. without any pain at all, which would either never disturb us, or else constantly do it as often as we thought of it, were there nothing but ideas floating in our minds, and appearances entertaining our fancies without the real existence of things affecting us from abroad.

Fourthly, Our senses in many cases bear witness to the truth of each other's report concerning the existence of sensible things without us: he that doubts when he sees a fire whether it be real, may, if he please, feel it too; and by the exquisite pain he will be convinced that it is not a bare idea or phantom.

After all, there are some who are so sceptical as to distrust their senses, and to doubt the existence of all things: one of the most ingenious in this class, was the late bishop Berkeley, who asserts that bodies have no existence but in a mind perceiving them; that is, they only exist when they are perceived. We shall not enter into a formal refutation of this singular hypothesis, but refer for a few remarks on the subject to the article IDEA. Our readers will, we hope, forgive us, if we here relate an anecdote of the late Dr. Samuel Johnson. It will supply the place of many arguments. Being once in company with a gentleman who warmly defended this notion of Berkeley: as the gentleman was quitting the room, the doctor called out, "Nay, sir, do not go." The disciple of Berkeley asking why? "because," replied Johnson, "when you are gone we shall cease to think of you, and then you will cease to exist!"

As when our senses are actually employed about any object, we know that it does exist; so by our memory we may be assured, that heretofore things that affected our senses have existed: and thus we have a knowledge of the past existence of several things, whereof our senses having informed us our memories still retain the ideas: and of this we are past all doubt, so long as we remember well.

As to the existence of spirits, our having ideas of them does not make us know that any such things do exist without us, or that there are any finite spirits, or any other spiritual beings but the eternal God. We have ground from revelation, and several other reasons, to believe with assurance, that there are such creatures: but our senses not being able to discover them, we want the means of knowing their particular existence; for we can no more know that there are finite spirits really existing, by the ideas we have of such beings, than by the ideas any one has of fairies, or centaurs, he can come to know, that things answering those ideas do really exist.

Hence we may gather, that there are two sorts of propositions: one concerning the existence of any thing answerable to such an idea, as that of an elephant, phœnix, motion, or angel, viz. whether such a thing does any where exist: and this knowledge is only of particulars, and not to be had of any thing without us, but only of God, any other way than by our senses.

Another sort of proposition is, wherein is expressed the agreement or disagreement of our abstracted ideas, and their dependence on one another. And these may be universal and certain: so having the idea of God and my self, of fear and obedience, I cannot but be sure that God is to be feared and obeyed by me: and this proposition will be certain concerning man in general, if I have made an abstract idea of such a species, whereof I am one particular. But such a proposition, how certain soever, proves not to me the existence of men in the world; but will be true of all such creatures, whenever they do exist. which certainty of such general propositions depends on the agreement or disagreement discoverable in those abstract ideas. In the former case, our knowledge is the consequence of the existence of things producing ideas in our minds by our senses. in the latter, the consequences of the ideas that are in our minds, and producing these general propositions, many whereof are called *eternæ veritates:* and all of them indeed are so; not from being written all or any of them in the minds of all men, or that they were any of them propositions in any one's mind, till he, having got the abstract ideas, joined or separated them by affirmation or negation; but wheresoever we can suppose such a creature as man is, endowed with such faculties, and thereby furnished with such ideas as we have, we must conclude he must needs, when he applies his thoughts to the consideration of his ideas, know the truth of certain propositions that will arise from the agreement or disagreement he will perceive in his own ideas. Such propositions being once made about abstract ideas, so as to be true, they will, whenever they can be supposed to be made again, at any time past, or to come, by a mind having those ideas, always be true: for names being supposed to stand perpetually for the same ideas, and the same ideas having immutably the same habitudes one to another, propositions concerning any abstract ideas that are once true must needs be eternal verities.

EXI'STENT. *a.* (from *exist.*) Having being; in possession of being (*Dryden*).

EXISTIMA'TION. *s.* (*existimatio*, Lat.) 1. Opinion. 2. Esteem.

EXIT. *s.* (Latin.) 1. The term set in the margin of plays to mark the time at which the player goes off. 2. Recess; departure, act of quitting the theatre of life (*Shakspeare*). 3. Passage out of any place (*Glanville*). 4. Way by which there is a passage out (*Woodward*).

EXITERIA, in antiquity, oblations or prayers, for a prosperous expedition or journey.

EXI'TIAL. Exi'tious. *a.* (*exitialis*, Lat.) Destructive; fatal; mortal (*Harvey*).

EXMOOR, a forest in Somersetshire, in the N.W. corner of that county, extending thence into Devonshire.

EXMOUTH, a village in Devonshire, on the E. side of the bay which forms the mouth of the river Ex. It is much frequented for sea-bathing.

EXOACA'NTHA, in botany, a genus of the class pentandria, order digynia. Involucre spinous: involucels halved, with unequal rays; all the flowers hermaphrodite; with equal, heart-shaped petals; seeds two; ovate, striate on one side, and flat on the other. One species only, a native of Syria, but of no pre-eminence.

EXOCATACŒLUS, in antiquity, a general denomination, under which were included several grand officers of the church at Constantinople.

EXOCŒTUS. Flying-fish. In zoology, a genus of the class pisces, order abdominales. Head scaly; mouth without teeth; the jaws connected at each side; gill-membrane seven-rayed; body whitish; belly angular; pectoral fins very large and long, the rays carinate on the fore-part. Three species, as follow. See Nat. Hist. Plate XCVII.

1. E. volans. Belly carinate on each side. Inhabits European, American, and Red seas; sometimes those of our own coasts; but is chiefly found between the tropics. By means of its long pectoral fins it is able to raise itself out of the water, and suspend itself in the air, and fly forwards to some distance till the fins become dry; by which means it often escapes from the jaws of sharks, dolphins, and other predatory fishes; but during its flight it is exposed to the talons of aquatic birds, the pelican, eagle, and albatross, which hover over the water for the purpose of catching it. There is a variety which is incapable of flight.

2. E. evolans. Belly not carinate. Inhabits the Spanish seas, and is perhaps only a variety of the last.

3. E. exiliens. Ventral fins reaching to the tail. Inhabits Carolina; and is larger than e. volitans.

EXODIARY, in the ancient Roman tragedy, was the person who, after the drama or play was ended, sung the exodium.

EXODIUM, in the ancient Greek drama, one of the four parts or divisions of tragedy, being so much of the piece as included the catastrophe and unravelling of the plot, and answering nearly to our fourth and fifth acts.

Exodium, among the Romans, consisted of certain humorous verses rehearsed by the exodiary at the end of the Fabulæ Atellanæ.

Exodium, in the Septuagint, signifies the end or conclusion of a feast. Particularly it is used for the eighth day of the feast of tabernacles, which, it is said, had a special view to the commemoration of the exodus or departure out of Egypt.

EXODUS, a canonical book of the Old Testament; being the second of the pentateuch, or five books of Moses. It is so called from the Greek ἔξοδος, the going out, or departure of the children of Israel from the land of Egypt; the history of which is delivered in this book, together with the many miracles wrought on that occasion. For the best proof of the authenticity of this book of Scripture, as well as of the others ascribed to Moses, with which we are acquainted, we refer to Dr. Graves's Lectures on the Pentateuch.

EXOLE'TE. *a.* (*exoletus*, Lat.) Obsolete; out of use.

To EXO'LVE. *v. a.* (*exolvo*, Latin.) To loose; to pay.

EXOMIS, in antiquity, a strait garment through which the shoulders appeared, worn by slaves, &c.

EXO'MPHALUS. (*exomphalus*, εξομφαλος, from εξ, out, and ομφαλος, the navel.) Exomphalos. An umbilical hernia. See HERNIA.

To EXO'NERATE. *v. a.* (*exonero*, Latin.) To unload; to disburden (*Ray*).

EXONERA'TION. *s.* (from *exonerate*.) The act of disburdening, or discharging (*Grew*).

EXO'PTABLE. *a.* (*exoptabilis*, Lat.) Desirable; to be sought with eagerness or desire.

EXOPHTHA'LMIA. (*exophthalmia*, εξοφθαλμια, from εξ, out, and οφθαλμος, the eye.) A swelling or protrusion of the bulb of the eye, to such a degree, that the eyelids cannot cover it. It may be caused by inflammation, when it is termed *exophthalmia inflammatoria*; or from a collection of pus in the globe of the eye, when it is termed *exophthalmia purulenta*; or from a congestion of blood within the globe of the eye, *exophthalmia sanguinea*.

E'XORABLE. *a.* (*exorabilis*, Lat.) To be moved by entreaty.

EXO'RBITANCE. EXO'RBITANCY. *s.* (from *exorbitant*.) 1. The act of going out of the track prescribed. 2. Enormity; gross deviation from rule or right (*Dryden*). 3. Boundless depravity (*Garth*).

EXO'RBITANT. *a.* (*ex* and *orbito*, Latin.) 1. Going out of the prescribed track. 2. Deviating from the course appointed or rule established (*Woodward*). 3. Anomalous; not comprehended in a settled rule or method (*Hooker*). 4. Enormous; beyond due proportion; excessive (*Addison*).

To EXO'RBITATE. *v. n.* (*ex* and *orbito*, Latin.) To deviate; to go out of the track or road prescribed (*Bentley*).

To E'XORCISE. *v. a.* (εξορκιζω) 1. To adjure by some holy name. 2. To drive away spirits by certain forms of adjuration. 3. To purify from the influence of malignant spirits by religious ceremonies (*Dryden*).

E'XORCISER. *s.* (from *exorcise*.) One who practises to drive away evil spirits.

EXORCISM, the expelling of devils from persons possessed by means of conjurations and prayers. The Jews made great pretences to this power. Josephus tells several wonderful tales of the great success of several exorcists. One Eleazer, a Jew, cured many dæmoniacs, he says, by means of a root set in a ring. This root, with the ring, was held under the patient's nose, and the devil was forthwith evacuated. The generality of conjurors of this class were impostors, each pretending to a secret nostrum or charm which was an overmatch for the devil. Our Saviour communicated to his disciples a real power over dæmons. (See DÆMONIAC.) Exorcism makes a considerable part of the superstition of the church of Rome, the rituals of which forbid the exorcising any person without the bishop's leave.

E'XORCIST. *s.* (εξορκιστης.) 1. One who by adjurations, prayers, or religious acts, drives away malignant spirits (*Acts*). 2. An enchanter; a conjurer: improperly (*Shakspeare*).

EXORDIUM, in oratory, the preamble, or beginning of a discourse or speech, serving to prepare the audience, and introduce the matter in hand. The word is formed from the Latin *ordiri*, to begin, by a metaphor taken from the weavers, who are said, *ordiri telam*, to begin or warp a web, by disposing and ordering the threads in a certain manner for the future work. See WARP.

The exordium, on other occasions, is called the prologue, prælude, and proem.

Cicero defines exordium a part of an oration, whereby the minds of the audience are duly prepared for what remains to be said. The exordium is a part of principal importance, and is to be laboured with extraordinary care; whence Tully calls it *difficillima pars orationis*.

Exordiums are of two kinds; either just and formal, or vehement and abrupt. In the first, the audience is prepared and conducted by due and easy steps; in the second, the orator, as if seized with some sudden passion, breaks out upon his audience at once. Such is that exordium of Isaiah; Hear, Oh heavens! and give ear, Oh earth! Or that of Cicero against Catiline: *Quousque tandem abutere patientia nostra, Catilina?* Abrupt exordiums are the most suitable on occasions of extraordinary joy, indignation, or the like; though we have instances of panegyrics of the greatest orators, begun abruptly, without any such occasions. Such is that of Gorgias, who began his eloge of the city and people of Elis with Ηλις, πολις ευδαιμων, *Elis beata civitas*. Abrupt, hasty, exordiums, were more to the taste and manner of the Greeks than of the Latins. The objects which the orator should have in view in this part of his discourse, are to gain the good opinion of his hearers, to secure their attention, and to give them some general notion of his subject.

EXORNA'TION. *s.* (*exornatio*, Lat.) Ornament; decoration: embellishment (*Hooker*).

EXO'SSATED. *a.* (*exossatus*, Latin.) Deprived of bones.

EXO'SSEOUS. *a.* (*ex* and *ossa*, Lat.) Wanting bones; boneless (*Brown*).

EXO'STOSIS. *s.* (*ex* and οστεον.) Any protuberance of a bone that is not natural (*Quincy*).

EXOSTO'SIS. (*exostosis*, εξοστωσις, from εξ, and οστεον, a bone.) Hyperostis. A morbid enlargement, or hard tumour of a bone. A genus of disease arranged by Cullen in the class locales, and order tumores.

EXOTERIC, and **Esoteric**, terms denoting external and internal, and applied to the double doctrine of the ancient philosophers: the one was public or exoteric, the other secret or esoteric. The first was that which they taught openly to the world, the latter was confined to a small number of disciples. See **Peripatetics.**

EXOTIC. (ἐξωτικος.) A term properly signifying foreign, or extraneous, i. e. brought from a remote or strange country. In which sense we sometimes say exotic, or barbarous terms or words, &c. The word is derived from the Greek ἐξω, ἐξωθεν, *extra*, without, on the outside.

Exotic, is chiefly applied to plants which are natives of foreign countries. The generality of exotics, or exotic plants, do not thrive in England without some peculiar care and culture; they require the warmth of their own climates; whence the use of hot-beds, glass-frames, green-houses, &c.

To EXPA'ND. *v. a.* (*expando*, Lat.) 1. To spread; to lay open as a net or sheet. 2. To dilate; to spread out every way (*Arbuthnot*).

EXPA'NSE. *s.* (*expansum*, Lat.) A body widely extended without inequalities (*Savage*).

Expa'nse, in botany, expanded, spread out: as the calyx in helianthus.

EXPANSIBI'LITY. *s.* (from *expansible.*) Capacity of extension; possibility to be expanded or spread into a wider surface (*Grew*).

EXPA'NSIBLE. *a.* (from *expansus*, Lat.) Capable to be extended (*Grew*).

EXPA'NSION. *s.* (from *expand.*) 1. The state of being expanded into a wider surface or greater space (*Bentley*). 2. The act of spreading out (*Grew*). 3. Extent; space to which any thing is extended (*Locke*). 4. Pure space, as distinct from extension in solid matter (*Locke*).

Expansion, in natural philosophy, the enlargement or increase of bulk in bodies, chiefly by means of heat. This is one of the most general effects of caloric, being common to all bodies whatever, whether solid or fluid, or in an æriform state. In some cases bodies seem to expand as they grow cold, as water in the act of freezing; this, however, is known to be no exception to the general rule, but is owing to the arrangement of the particles, or to crystallization, and is not a regular and gradual expansion like that of metals, or other solid substances by means of heat. In various metals likewise an expansion takes place in passing from a fluid to a solid state, which is accounted for in the same way. The expansion of solids is exhibited by the **Pyrometer** (which see); a rod of iron, for instance, becomes sensibly longer and larger in all its dimensions in passing from a low to a high state of temperature. The expansion of fluids is shewn by the thermometer, and is the principle upon which that useful instrument is constructed; by immersing a thermometer into hot water, the mercury, or other fluid, contained in it immediately expands. See **Thermometer.** The degree of expansion produced in different liquids, varies very considerably. In general, the denser the fluid, the less the expansion; water expands more than mercury, and alcohol, which is lighter than water, expands more than water. The expansion of æriform fluids may be exhibited by bringing a bladder, partly filled with air, and the neck closely tied, near the fire; the bladder will soon be distended, and will, if the heat be strong enough, burst.

The following table will give the reader a precise notion of the rate of expansion of those liquids which have been hitherto examined by chemical philosophers.

Temp.	Mercury.	Linseed oil.	Sulphuric acid.	Nitric acid.	Water.	Oil of turpentine.	Alcohol.
30°	100000	100000	—	—	—	—	100000
40	100081	—	99752	99514	—	—	100539
50	100183	—	100000	100000	100023	100000	101105
60	100304	—	100279	100486	100091	100460	101688
70	100406	—	100558	100990	100197	100993	102281
80	100508	—	100806	101530	100322	101471	102890
90	100610	—	101054	102088	100694	101931	103517
100	100712	102760	101317	102620	100908	102446	104162
110	100813	—	101540	103196	—	102943	—
120	100915	—	101034	103776	101404	103421	—
130	101017	—	102097	104352	—	103954	—
140	101119	—	102320	105132	—	104573	—
150	101220	—	102614	—	102017	—	—
160	101322	—	102893	—	—	—	—
170	101424	—	103116	—	—	—	—
180	101526	—	103339	—	—	—	—
190	101628	—	103587	—	103617	—	—
200	101730	—	103911	—	—	—	—
212	101835	107250	—	—	104577	—	—

There are cases in which expansion is produced not by an increase, but by a diminution of temperature. These exceptions may be divided into two classes. The first class comprehends certain liquid bodies which have a maximum of density corresponding with a certain temperature; and which, if they are heated above that temperature, or cooled down below it, undergo in both cases an expansion or increase of bulk. The second class comprehends certain liquids which suddenly become solid when cooled down to a certain temperature; and this solidification is accompanied by an increase of bulk.

Water furnishes us with the most remarkable example of the first class of bodies. Its maximum of density corresponds with 42°.5 of Fahrenheit's thermometer, as has been lately ascertained by Mr. Dalton. If it is cooled down below 42°.5, it undergoes an expansion for every degree of temperature which it loses; and at 32° the expansion amounts, according to Mr. Dalton, to $\frac{1}{150}$ of the whole expansion which water undergoes when heated from 42°.5 to 212°. With this, more recent experiments coincide very nearly; for by cooling 100000 parts in bulk of water from 42°.5 to 32°, they were converted to 100031 parts. We are indebted to the ingenuity of Mr. Dalton for the discovery of a very unexpected fact, that the expansion of water is the same for any number of degrees above or below the maximum of density. Thus if we heat water ten degrees above 42°.5, it occupies precisely the same bulk as it does when cooled down ten degrees below 42°.5. Therefore the density of water at 32° and at 53° is precisely the same. Mr. Dalton succeeded in cooling water down to the temperature of 5° without freezing, or 37°.5 below the maximum point of density; and during the whole of that range, its bulk precisely corresponds with the bulk of water the same number of degrees above 42°.5. Thus the bulk of water at 5° is the same as the bulk of water at 80°. The scale of expansion, therefore, which has been given for the expansion of water when heated, answers also for its expansion when cooled, provided the table begin at 42°.5, as is done in the table of the expansion of water. From this table it appears that the expansion of water, the original bulk being 10000, may be expressed pretty nearly by the following numbers:

Temp.	Expan.
82°.5	$6.^2$
102°.5	8^2
122°.5	10^2
142°.5	12^2
162°.5	14^2

The greatest deviation from these numbers is towards the beginning of the scale, when owing to the smallness of the expansion, it is difficult to measure it with precision. It leads us to this remarkable conclusion, that the squares of the natural numbers beginning at 6 indicate the increase of bulk which 10000 parts of water experience for every ten degrees they are heated above 82°.5, or cooled below 12°.5. This rule will give the reader a more precise idea of the rate at which water expands when heated or cooled, than a bare inspection of the table could do.

A considerable number of liquids has been tried to ascertain whether any of them, like water, have a temperature in which their density is a maximum, and which expand when cooled below that temperature. Sulphuric acid has no such point, neither have the oily bodies; but some solutions of salt in water begin to expand before they become solid. These solutions, however, when cooled down sufficiently, crystallize with such rapidity, that it is extremely difficult to be certain of the fact, that they really do begin to expand before they crystallize.

That class of bodies which undergo an expansion when they change from a liquid to a solid body by the diminution of temperature, is very numerous. Not only water when converted into ice undergoes such an expansion, but all bodies which by cooling assume the form of crystals.

The prodigious force with which water expands in the act of freezing has been long known to philosophers. Glass bottles filled with water are commonly broken in pieces when the water freezes. The Florentine academicians burst a brass globe whose cavity was an inch in diameter, by filling it with water and freezing it. The force necessary for this effect was calculated by Muschenbroeck at 27720 lbs. But the most complete set of experiments on the expansive force of freezing water, are those made by major Williams at Quebec, and published in the second volume of the Edinburgh transactions. This expansion has been explained, by supposing it the consequence of a tendency which water, in consolidating, is observed to have to arrange its particles in one determinate manner, so as to form prismatic crystals, crossing each other at angles of 60° and 120°. The force with which they arrange themselves in this manner must be enormous, since it enables small quantities of water to overcome so great mechanical pressures. Various methods have been tried to ascertain the specific gravity of ice at 32°; that which succeeded best was to dilute spirits of wine with water till a mass of solid ice put into it remained in any part of the liquid without either sinking or rising. The specific gravity of such a liquid is 0,92, which of course is the specific gravity of ice, supposing the specific gravity of water at 60° to be 1. This is an expansion much greater than water experiences even when heated to 212°. We see from this, that water, when converted into ice, no longer observes that equable expansion measured by Mr. Dalton, but undergoes a very rapid and considerable augmentation of bulk. See FREEZING.

The very same expansion is observed during the crystallization of most of the salts; all of them at least which shoot into prismatic forms. Hence the reason that the glass vessels in which such liquids are left, usually break to pieces when the crystals are formed.

This expansion of these bodies cannot be considered as an exception to the general fact, that bodies increase in bulk when heat is added to them; for the expansion is the consequence, not of the diminution of heat, but of the change in their state from liquids to solids, and the new arrangement of their particles which accompanies or constitutes that change.

It must be observed, however, that all bodies do not expand when they become solid. There are a considerable number which diminish in bulk; and in these the rate of diminution in most cases is rather increased by solidification. When liquid bodies are converted into solids, they either form prismatic crystals, or they form a mass in which no regularity of arrangement can be perceived. In the first case, expansion accompanies solidification; in the second place, contraction accompanies it. Water and all the salts furnish instances of the first, and tallow and oils are examples of the second. In these last bodies the solidification does not take place instantaneously, as in water and salts, but slowly and gradually: they first become viscid, and at last quite solid. Most of the oils, when they solidify, form very regular spheres. The same thing happens to honey, and to some metals. It has been thought that all combustible liquids contract, when they become solid, while incombustible liquids expand; but there are exceptions to this rule. Sulphuric acid does not by congelation alter its appearance; but cast iron, and perhaps sulphur also, expand in the act of congealing.

According to the latest researches of Dalton, it appears that

1st. All pure homogeneous liquids, as water and mercury, expand from the point of their congelation, or greatest density, a quantity always as the square of the temperature from that point.

2. The force of steam from pure liquids, as water, ether, &c. constitutes a geometrical progression to increments of temperature in arithmetical progression.

3. The expansion of permanent elastic fluids is in geometrical progression to equal increments of temperature.

4. The refrigeration of bodies is in geometrical progression in equal increments of time.

Judging from analogy we may conjecture that the expansion of solids is progressively increasing with the temperature: but whether it is a geometrical progression, like elastic fluids; or one increasing as the square of the temperature, like liquids; or as the third or any power of the temperature; still if it be estimated from absolute cold (supposed to be about 6150°, on Fahrenheit, below the temperature of freezing water) it must appear to be nearly uniform, or in arithmetical progression to the temperature, for so small and remote an interval of temperature as that between freezing and boiling water.

The following table exhibits the expansion of the principal subjects hitherto determined, for 180° of temperature; that is, from 32° to 212° of Fahrenheit. The bulk and length of the articles at 32° are denoted by 1.

SOLIDS.	EXPANSION. In bulk.	In length.
Brown earthen ware......	·0012 = $\frac{1}{800}$	$\frac{1}{2400}$
Stone ware.............	·0025 = $\frac{1}{400}$	$\frac{1}{1200}$
Glass, (thin) rods and tubes	.0025 = $\frac{1}{400}$	$\frac{1}{1200}$
bulbs	·0037 = $\frac{1}{270}$	$\frac{1}{810}$
Platinum	·0026 = $\frac{1}{385}$	$\frac{1}{1155}$
Steel	·0034 = $\frac{1}{294}$	$\frac{1}{882}$
Iron..................	·0038 = $\frac{1}{263}$	$\frac{1}{790}$
Gold	·0042 = $\frac{1}{238}$	$\frac{1}{714}$
Bismuth	·0042 = $\frac{1}{238}$	$\frac{1}{714}$
Copper	·0051 = $\frac{1}{196}$	$\frac{1}{588}$
Brass	·0056 = $\frac{1}{178}$	$\frac{1}{533}$
Silver	·0060 = $\frac{1}{160}$	$\frac{1}{480}$
Fine pewter	·0068 = $\frac{1}{149}$	$\frac{1}{446}$
Tin	·0074 = $\frac{1}{133}$	$\frac{1}{400}$
Lead	·0086 = $\frac{1}{116}$	$\frac{1}{348}$
Zinc..................	·0093 = $\frac{1}{105}$	$\frac{1}{322}$
LIQUIDS.	In bulk.	
Mercury...............	·0200 = $\frac{1}{50}$	
Water	·0466 = $\frac{1}{21.5}$	
Water sat. with salt	·0500 = $\frac{1}{20}$	
Suphuric acid	·0600 = $\frac{1}{17}$	
Muriatic acid..........	·0600 = $\frac{1}{17}$	
Oil of turpentine	·0700 = $\frac{1}{14}$	
Ether	·0700 = $\frac{1}{14}$	
Fixed oils	·0800 = $\frac{1}{12.5}$	
Acohol	·0110 = $\frac{1}{9}$	
Nitric acid	·0110 = $\frac{1}{9}$	
ELASTIC FLUIDS.		
Gases of all kinds	·367 = $\frac{3}{8}$	

On the supposition that metals expand equably, the expansion of a mass of metal, by being heated a given number of degrees, is as follows: Let a = the expansion of the mass in length for 1°, which must be found by experiment; b = the number of degrees whose expansion is required; s = the solid contents of the metalic mass; x = the expansion sought; then $x = 3\,b\,a\,s$. (*Borda, Dalton, Ellicott, Gregory, Smeaton*).

EXPA'NSIVE. *a.* (from *expand.*) Having the power to spread into a wider surface (*Ray*).

To EXPA'TIATE. *v. n.* (*expatior*, Latin.) 1. To range at large (*Addison*). 2. To enlarge upon in language (*Broome*). 3. To let loose; to allow to range (*Dryden*).

To EXPE'CT. *v. a.* (*expecto*, Latin.) 1. To have a previous apprehension of either good or evil (*Milton*). 2. To wait for; to attend the coming (*Dryden*).

To Expe'ct. *v. n.* To wait; to stay (*Job*).

EXPE'CTABLE. *a.* (from *expect.*) To be expected; to be hoped or feared (*Brown*).

EXPE'CTANCE. Expe'ctancy. *s.* (from *expect.*) 1. The act or state of expecting (*Ben Jonson*). 2. Something expected (*Shakspeare*). 3. Hope (*Shakspeare*).

EXPE'CTANT. *a.* (French.) Waiting in expectation (*Swift*).

Expe'ctant. *s.* (from *expect.*) One who waits in expectation of any thing (*Pope*).

EXPECTA'TION. *s.* (*expectatio*, Latin.) 1. The act of expecting (*Shakspeare*). 2. The state of expecting either with hope or fear (*Rogers*). 3. Prospect of any thing good to come (*Ps.*). 4. The object of happy expectation; the Messiah expected (*Milt.*). 5. A state in which something excellent is expected from us (*Ot.*).

Expectation, in the doctrine of chances, is applied to any contingent event, upon the happening of which some benefit, &c. is expected. This is capable of being reduced to the rules of computation; for a sum of money in expectation when a particular event happens, has a determinate value before that event happens. Thus, if a person is to receive any sum, as 10*l.* when an event takes place which has an equal chance or probability of happening and failing, the value of the expectation is half that sum, or 5*l.*; but if there are three chances for failing, and only one for its happening, or one chance only in its favour out of all the four chances, then the probability of its happening is only one out of four, or ¼, and the value of the expectation is but ¼ of 10*l.* which is only 2*l.* 10*s.* or half the former sum. And in all cases, the value of the expectation of any sum is found by multiplying that sum by the fraction expressing the probability of obtaining it. So the value of the expectation on 100*l.* when there are three chances out of five for obtaining it, or when the probability of obtaining it is 3-fifths, is 3-fifths of 100*l.* which is 60*l.* And if *s.* be any sum expected on the happening of an event, *h* the chances for that event happening, and *f* the chances for its failing; then, there being *h* chances out of $f+h$ for its happening, the probability will be $\frac{h}{f+h}$, and the value of the expectation is $\frac{h}{f+h} \times s$. See Chances.

Expectation of life, in the doctrine of life annuities, is the share, or number of years of life, which a person of a given age may, upon an equality of chance, expect to enjoy.

By the expectation or share of life, says Mr. Simpson (Select Exercises, p. 273), is not here to be understood that particular period which a person hath an equal chance of surviving; this last being a different and more simple consideration. The expectation of a life, to put it in the most familiar light, may be taken as the number of years at which the purchase of an annuity, granted upon it, without discount of money, ought to be valued. Which number of years will differ more or less from the period above mentioned, according to the different degrees of mortality to which the several stages of life are incident. Thus it is much more than an equal chance, according to the table of the probability of the duration of life which the same author has given us, that an infant, just come into the world, arrives not to the age of ten years; yet the expectation or share of life due to it, upon an average, is near twenty years. The reason of which wide difference is the great excess of the probability of mortality in the first tender years of life, above that respecting the more mature and stronger ages. Indeed, if the numbers that die at every age were to be the same, the two quantities above specified would also be equal; but when the said numbers become continually less and less, the expectation must of consequence be the greater of the two.

Mr. Simpson has given a table and rule for finding this expectation, pa. 255 and 273 as above. Thus:

A Table of the Expectations of Life in London.

Age.	Expectation.	Age.	Expectation
1	27·0	41	19·2
2	32 0	42	18·8
3	34·0	43	18·5
4	35 6	44	18·1
5	36·0	45	17·8
6	36·0	46	17·4
7	35·8	47	17·0
8	35·6	48	16·7
9	35·2	49	16·3
10	34·8	50	16·0
11	34 3	51	15·6
12	33·7	52	15·2
13	33·1	53	14·9
14	32 5	54	14·5
15	31·9	55	14·2
16	31·3	56	13·8
17	30 7	57	13·4
18	30·1	58	13·1
19	29·5	59	12·7
20	28·9	60	12·4
21	28·3	61	12·0
22	27·7	62	11·6
23	27·2	63	11·2
24	26 6	64	10·8
25	26·1	65	10·5
26	25·6	66	10·1
27	25·1	67	9·8
28	24 6	68	9·4
29	24·1	69	9·1
30	23 6	70	8·8
31	23·1	71	8·4
32	22·7	72	8·1
33	22 3	73	7 8
34	21·9	74	7·5
35	21·5	75	7·2
36	21·1	76	6·8
37	20 7	77	6·4
38	20 3	78	6·0
39	19 9	79	5·5
40	19·6	80	5·0

For example, if it be required to find the expectation or share of life due to a person of 30 years old. Opposite the given age in the first column of the table, stands 23·6 in the second col. for the years in the expectation sought.

See De Moivre's Doctrine of Chances applied to the Valuation of Annuities, p. 288; or Dr. Price's Observations on Reversionary Payments, p. 168, 364, 374, &c.; or Philos. Trans. vol. 59, p. 89.

EXPE'CTER. *s.* (from *expect.*) 1. One who has hopes of something (*Swift*). 2. One who waits for another (*Shakspeare*).

To EXPE'CTORATE. *v. a.* (*ex* and *pectus*, Latin.) To eject from the breast (*Arbuthnot*).

EXPECTORA'TION. *s.* (from *expectorate.*) 1. The act of discharging from the breast. 2. That discharge which is made by coughing (*Arbuthnot*).

EXPECTORA'TIVE. *a.* (from *expectorate.*) Having the quality of promoting expectoration (*Harvey*).

EXPECTORANTS. (*Expectorantia, sc. medicamenta*, from *expectoro*, to discharge from the breast.) Under this title are to be considered those medicines which can, with safety, be employed to increase the discharge of mucus from the lungs. The different articles referred to this class may be divided into the following orders; 1. *Nauseating expectorants*, as squills, ammoniacum, and garlic, which are to be preferred for the aged and phlegmatic. 2. *Stimulating expectorants*, as marrubium, which is adapted to the young and irritable, and those easily affected by expectorants. 3. *Antispasmodic expectorants*, as vesicatories, pediluvium, and watery vapours; these are best calculated for the plethoric and irritable, and those liable to spasmodic affections. 4. *Irritable expectorants*, as fumes of tobacco and acid vapours. The constitutions to which these are chiefly adapted are those past the period of youth, and those in whom there are evident marks of torpor, either in the system generally, or in the lungs in particular.

EXPEDIATE. (In forest-law). A term applied to the barbarous operation of cutting out the centrical ball of the foot of a dog, or such claws as may totally prevent his pursuit of game. In earlier times, when the forest laws were more rigidly enforced, the owner of any dog not expediated, and living within a forest district, was liable to a fine.

EXPEDIENCE. EXPE'DIENCY. *s.* (from *expedient.*) 1. Fitness; propriety; suitableness to an end (*South*). Expedition; adventure (*Shakspeare*). 3. Haste; dispatch (*Shakspeare*).

EXPE'DIENT. *a.* (*expedit*, Latin.) 1. Proper; fit; convenient; suitable (*Tillotson*). 2. Quick; expeditious (*Shakspeare*).

EXPE'DIENT. *s.* (from the adjective.) 1. That which helps forward, as means to an end (*Decay of Piety*). 2. A shift; means to an end contrived in an exigence, or difficulty (*Woodward*).

EXPEDIENTS FOR OBTAINING THE FIRST FIGURES OF THE ROOTS OF EQUATIONS. Among these the most common are such as are described or alluded to under the article CONSTRUCTION. But sir Isaac Newton found out two other expedients for the same purpose, the most commodious of which was this: Let there be several of those graduated lines, called Gunter's lines, placed in a frame thus: the first AB fixed upon the side of the frame, (fig. 11, Pl. 57.) and the rest upon parallel sliders; the first of which, CD, shall be the same with AB; the second EF shall have its divisions but half as long, the divisions of the third GH one third, and those of the fourth IK one fourth, of the divisions of the first: then, when the beginning of these lines stand under each other, if any line LM be drawn perpendicularly across them, it will mark upon the first of the sliders the same number as on the fixt line, upon the second slider the square of that number, upon the third the cube, and upon the fourth the biquadrate of the same. But if any one of these sliders be moved backwards, the transverse line LM will mark upon that slider the respective power of the forementioned number, multiplied by the number which in this slider, in its present situation, stands directly under the point A, the beginning of the fixed line. Now let an equation given be $az+bz^2-cz^3+dz^4=m$. Move the slider CD back (fig. 12. Pl. 57.) till the number *a* upon it, stand directly under A: bring likewise *b* on the slider EF, *c* on GH and *d* on IK respectively, under A. Then, when the transverse line LM is put in such a situation as to mark upon the line AB the true value of *z* the root of the equation, it will give upon CD the value of az, upon EF that of bz^2, upon GH that of cz^3, and upon IK that of dz^4: consequently, when the numbers marked upon the sliders by the transverse line amount to *m*, as collected together under their proper signs, a root *z* is marked upon AB. See Robins's Tracts, vol. ii. p. 349.

EXPE'DIENTLY. *ad.* (from *expedient.*) 1. Fitly; suitably; conveniently. 2. Hastily; quickly: not used (*Shakspeare*).

To E'XPEDITE. *v. a.* (*expedio*, Latin.) 1. To facilitate; to free from impediment. 2. To hasten; to quicken (*Swift*). 3. To dispatch; to issue from a publick office (*Bacon*).

E'XPEDITE. *a.* (*expeditus*, Latin.) 1. Quick; hasty; soon performed (*Sandys*). 2. Easy; disencumbered; clear (*Hooker*). 3. Nimble; active; agile (*Tillotson*). 4. Lightly armed (*Bacon*).

E'XPEDITELY. *ad.* (from *expedite.*) ss; readily; hastily (*Grew*).

TION. *s.* (from *expedite.*) 1. Haste; speed; activity (*Hooker*). 2. A march or voyage with martial intentions (*Shaks.*).

EXPEDI'TIOUS. *a.* (from *expedite.*) 1. Speedy; quick; soon done. 2. Nimble; swift; acting with celerity.

EXPEDI'TIOUSLY. *ad.* Speedily; nimbly.

To EXPE'L. *v. a.* (*expello*, Latin.) 1. To drive out; to force away (*Burnet*). 2. To eject; to throw out (*Bacon*). 3. To banish;

to drive from the place of residence (*Dryden*). 4. To reject; to refuse (*Spenser*). 5. To keep off; to exclude (*Shakspeare*).

EXPE'LLER. *s.* One that expels or drives away.

To **EXPE'ND.** *v. a.* (*expendo*, Latin.) To lay out; to spend (*Hayward*).

EXPE'NDITURE. *s.* Money expended in a certain stated interval; as a year.

Abstract of the total Public Expenditure of Great Britain, for the Year ending the 5th of January 1808.

				l.	*s.*	*d.*
Interest on the Public Funded Debt unredeemed				20,701,252	0	4¾
Charges of Management on ditto				297,757	16	1½
Sums applicable to the Reduction of the Debt				9,479,164	12	3½
Interest on Exchequer Bills				1,574,361	18	5
The Civil List				958,000	0	0
Allowances to the Royal Family, Pensions, &c				290,171	4	9½
Other Charges on the Consolidated Fund, viz. Courts of Justice, the Mint, Salaries, Allowances, Bounties, &c				345,990	14	11½
The Civil Government of Scotland				85,359	3	3½
Bounties for promoting the Fisheries, Manufactures, Corn, &c				438,991	13	8¼
Other Payments in Anticipation of the Exchequer Receipt, viz. Pensions on the Hereditary Revenue, Militia and Deserters Warrants, Volunteers, &c.				235,897	10	0¾
The Navy	9,713,547	19	8	16,775,761	9	3
Victualling Department	4,932,777	19	9			
Transport do. sick and wounded Seamen and Prisoners	1,839,435	9	10			
Miscellaneous Services	300,000	0	0			
The Ordnance				4,190,748	6	6
The Army Ordinary Services	9,314,909	0	9	15,388,550	14	4
Extraordinary Services	5,431,867	0	11			
Volunteer Corps	641,774	12	8			
Loans to Ireland and Proportion of Lotteries				3,681,251	3	4
Miscellaneous Services at Home, viz. for maintaining and employing Convicts, Prosecutions, Printing Journals of the House of Commons and other Papers, Naval Asylum, British Museum, Veterinary College, American Loyalists, Clergy and Laity of France, Toulonese, Dutch and Corsican Emigrants, &c				1,049,205	7	8¾
Miscellaneous Services Abroad, viz. Foreign Secret Service, maintaining Forts and Settlements on the Coast of Africa, Civil Establishment of Canada, Nova Scotia, New South Wales, Sierra Leone, &c				178,177	13	0
Total				£.75,670,641	8	2

EXPE'NSE. *s.* (*expensum*, Latin.) Cost; charges; money expended (*Ben Jonson*).

EXPE'NSEFUL. *a.* Costly; expensive (*Wotton*).

EXPE'NSELESS. *a.* Without cost (*Milton*).

EXPE'NSIVE. *a.* (from *expense.*) 1. Given to expense; extravagant (*Temple*). 2. Costly; requiring expense. 3. Liberal; distributive (*Sprat*).

EXPE'NSIVELY. *ad.* With great expense.

EXPE'NSIVENESS. *s.* 1. Addition to expense; extravagance. 2. Costliness (*Arbuthnot*).

EXPE'RIENCE. *s.* (*experientia*, Latin.) 1. Practice; frequent trial. (*Raleigh*). 2. Knowledge gained by practice (*Shakspeare*).

To **EXPE'RIENCE.** *v. a.* 1. To try; to practise. 2. To know by practice (*Milton*).

EXPE'RIENCED. *participial a.* 1. Made skilful by experience (*Locke*). 2. Wise by long practice (*Pope*).

EXPE'RIENCER. *s.* One who makes trial; a practiser of experiments (*Digby*).

EXPE'RIMENT. *s.* (*experimentum*, Lat.) Trial of any thing; something done in order to discover an uncertainty or unknown effect (*Bacon*).

To **EXPE'RIMENT.** *v. a.* (from the noun.) 1. To try; to search out by trial (*Ray*). 2. To know by experience (*Locke*).

EXPERIME'NTAL. *a.* 1. Pertaining to experiment. 2. Built upon experiment (*Brown*). 3. Known by experiment or trial (*Newton*).

EXPERIMENTAL PHILOSOPHY, is that which proceeds on experiments, or which deduces the laws of nature and the properties and powers of bodies, and their actions upon each other, from sensible experiments and observations.

Experiments are of the utmost importance in philosophy; and the great advantages the modern physics have over the ancient is chiefly owing to this, viz. that we abound much more in experiments, and that we make more use of the experiments we have. The method of the ancients was chiefly to begin with the causes of things, and thence argue to the phenomena and effects; on the contrary, that of the moderns proceeds from experiments and observations, from whence the properties and laws of natural things are deduced, and general theories are formed.

Several of the ancients, indeed, thought as highly of experiments as the moderns, and practised them also. Plato omits no occasion of speaking of the advantages of them; and Aristotle's history of animals bears ample testimony for him. Democritus's great employment was to make experiments; and even Epicurus himself owes part of his fame to the same cause.

Among the moderns, the making of experiments was chiefly begun by friar Bacon, in the thirteenth century, who it seems spent a great deal of money and labour in this way. After him, the lord chancellor Bacon is looked upon as the founder of the present mode of philosophising by experiments. And his method has been prosecuted with laudable emulation by the Academy del Cimento, the Royal Society, the Royal Academy at Paris; by Mr. Boyle, and above all, by sir Isaac Newton, as well as by many other illustrious philosophers.

Indeed, experiments, within the last century, are come so much into vogue, that nothing will pass in philosophy, but what is either founded on experiments, or confirmed by them; so that the new philosophy is almost wholly experimental.

Yet there are some, even among the learned, who speak of experiments in a different manner, or perhaps rather of the abuse of them, and in derision of the pretenders to the practice. Thus, though Dr. Keil allows that philosophy has received very considerable advantages from the makers of experiments; yet he complains of their disingenuousness, in too often wresting and distorting their experiments and observations to favour some darling theories they had espoused. Nay more, M. Hartsoeker, in his Recueil de plusieurs Pieces de Physique, undertakes to shew, that such as employ themselves in the making of experiments are not properly philosophers, but as it were the labourers or operators of philosophers, who work under them, and for them, furnishing them with materials to build their systems and hypotheses upon. And the learned M. Dacier, in the beginning of his discourse on Plato, at the head of his translation of the works of that philosopher, deals still more severely with the makers of experiments. He breaks out with a kind of indignation at a tribe of idly-curious people, whose sole employment consists in making experiments on the gravity of the air, the equilibrium of fluids, the loadstone, &c. and yet arrogate to themselves the noble title of philosophers. It does not follow, however, that because experiments are sometimes diverted into an improper or a worthless channel, therefore they can never be employed with propriety or advantage.

The object of experimental philosophy is the knowledge of nature in general, or, more strictly, that of the properties of natural substances, and of the changes of those properties in different circumstances. This knowledge can only be obtained by experiment or observation; as that clay is capable of becoming hard by means of fire, and thereby being made into bricks, and that by the same means limestone can be converted into quick-lime, and, by the addition of water and sand, make mortar. It is by observation also that we discover that stones and other heavy bodies fall to the ground, and that a magnet will attract iron. In other words, experimental philosophy is an investigation of the wisdom of God in the works and the laws of nature, so that it is one of the greatest objects to the mind of man, and opens a field of inquiry which has no bounds; every advance we make suggesting new doubts and subjects of farther inquiry.

The uniformity we discover in the properties of natural substances enables us to lay down general rules or principles, which, being invariable, we call the laws of nature; and by our knowledge of these laws we are able to predict, and at our own pleasure to produce, particular results; and this is the source of all the powers of man. It is the direction we acquire of the powers of nature; so that, as lord Bacon observed, knowledge is power.

In our inquiries into nature, we are to be conducted by those rules and maxims which are found to be genuine, and consonant to a just method of physical reasoning; and these rules of philosophizing are by the greatest master in science, sir Isaac Newton, reckoned four, which are as follows:

1. More causes of natural things are not to be admitted, than are both true, and sufficient to explain the phænomena; for nature does nothing in vain, but is simple, and delights not in superfluous causes of things.

2. And, therefore, of natural effects of the same kind, the same causes are to be assigned, as far as it can be done; as of respiration in man and beasts, of the descent of stones in Europe and America, of light in a culinary fire and in the sun, and of the reflection of light in the earth and in the planets.

3. The qualities of natural bodies which cannot be increased or diminished, and agree to all bodies in which experiments can be made, are to be reckoned as the qualities of all bodies whatsoever: thus, because extension, divisibility, hardness, impenetrability, mobility, the vis interiæ, and gravity, are found in all bodies which fall under our cognizance or inspection, we may justly conclude they belong to all bodies whatsoever, and are, therefore, to be esteemed the original and universal properties of all natural bodies.

4. In experimental philosophy, propositions collected from the phænomena by induction, are to be deemed (notwithstanding contrary hypotheses) either exactly or very nearly true, till other phænomena occur, by which they may be rendered either more accurate, or liable to exception. This ought to be done, lest arguments of induction should be destroyed by hypotheses.

These four rules of philosophizing are premised by sir Isaac Newton to his third book of the Principia; and more particularly explained by him in his Optics, where he exhibits the method of proceeding in philosophy, the first part of which is as follows:

"As in mathematics, so in natural history, the investigation of difficult things, by way of analysis, ought always to precede the method of composition. This analysis consists in making experiments and observations, and in drawing general conclusions from them by induction (i. e. reasoning from the analogy of things by natural consequence) and admitting no objections against the conclusions, but what are taken from experiments or certain truths. And although the arguing from experiments and observation, by induction, be no demonstration of general conclusions, yet it is the best way of arguing which the nature of things admits of, and may be looked on as so much the stronger, by how much the induction is more general; and if no exception occur from phænomena, the conclusion may be pronounced generally; but if, at any time afterwards, any exception shall occur from experiments, it may then be pronounced with such exceptions: by this way of analysis we may proceed from compounds to ingredients, and from motions to the causes producing them; and, in general, from effects to their causes; and from particular causes to more general ones, till the argument ends in the most general: this is the method of analysis. And that of synthesis, or composition, consists in assuming causes, discovered and established as principles, and by their explaining the phænomena, proceeding from them, and proving the explanations."

It is unnecessary to say more, in this place, on experimental philosophy generally: the reader will turn for information on individual subjects, as he has occasion, to CATOPTRICS; DIOPTRICS, HYDROSTATICS, MECHANICS, OPTICS, PNEUMATICS, ELECTRICITY, MAGNETISM, &c. &c. &c. Also AEROSTATION, ATMOSPHERE, BURNING GLASS, COLD, COLOUR, FREEZING, EVAPORATION, FIRE, FLUIDITY, HEAT, IGNITION, LIGHT, SOUND, STEAM, WATER, WIND, &c.

EXPERIME'NTALLY. *ad.* By experience; by trial (*Evelyn*).

EXPERIME'NTER. *s.* (from *experiment.*) One who makes experiments (*Digby*).

EXPERIMENTUM CRUCIS, a capital, leading, or decisive experiment; thus termed, either on account of its being like a cross or direction post, placed in the meeting of several roads, guiding men to the true knowledge of the nature of that thing they are inquiring after; or, on account of its being a kind of torture, whereby the nature of the thing is, as it were, extorted by force.

EXPE'RT. *a.* (*expertus*, Lat.) 1, Skilful; addressful; intelligent (*Prior*). 2. Ready; dexterous (*Dryden*). 3. Skilful by practice or experience (*Bacon*).

EXPE'RTLY. *ad.* In a skilful ready manner.

EXPE'RTNESS. *s.* (from *expert.*) Skill; readiness; dexterity (*Knolles*).

E'XPIABLE. *a.* Capable to be expiated.

To **E'XPIATE.** *v. a.* (*expio*, Latin.) 1. To annul the guilt of a crime by subsequent acts of piety; to atone for (*Bacon*). 2. To avert the threats of prodigies. 3. To make reparation for (*Clarendon*).

EXPIA'TION. *s.* (from *expiate.*) 1. The act of expiating or atoning for any crime. 2. The means by which we atone for crimes; atonement (*Dryden*). 3. Practices by which the threats of ominous prodigies were averted (*Hayward*).

EXPIATION (Feast of), among the Jews, called by our translators the day of atonement, was held on the tenth day of Tisri, or the seventh month of the Jewish year, answering to part of our September and October. It was instituted by God himself, Levit. xxiii. 27, &c. On that day the high-priest, the figure or type of Jesus Christ, entered into the most holy place, and confessed his sins; and, after several ceremonies, made an atonement for all the people to wash them from their sins. Lev. chap. xvi.

E'XPIATORY. *a.* (from *expiate.*) Having the power of expiation (*Hooker*).

EXPILA'TION. *s.* (*expilatio*, Lat.) Robbery; the act of committing waste upon land to the loss of the heir.

EXPIRA'TION. *s.* (from *expire.*) 1. That act of respiration which thrusts the air out of the lungs (*Arbuthnot*). 2. The last emission of breath; death (*Rambler*). 3. Evaporation; act of fuming out. 4. Vapour; matter expired (*Bacon*). 5. The cessation of any thing to which life is figuratively ascribed (*Boyle*). 6. The conclusion of any limited time (*Shakspeare*).

To **EXPI'RE.** *v. a.* (*expiro*, Lat.) 1. To breathe out (*Spenser*). 2. To exhale; to send out in exhalations (*Woodward*). 3. To close; to conclude: obsolete (*Spenser*).

To **EXPI'RE.** *v. n.* 1. To make an emission of the breath (*Walter*). 2. To die; to breathe the last (*Pope*). 3. To perish; to fall; to be destroyed (*Spenser*). 4. To fly out with a blast (*Dryden*). 5. To conclude; to come to an end (*Shakspeare*).

To **EXPLA'IN.** *v. a.* (*explano*, Lat.) To expound; to illustrate; to clear (*Gay*).

EXPLA'INABLE. *a.* (from *explain.*) Capable of being explained or interpreted (*Brown*).

EXPLAI'NER. *s.* (from *explain.*) Expositor; interpreter; commentator.

EXPLANA'TION. *s.* (from *explain.*) 1. The act of explaining or interpreting. 2. The sense given by an explainer (*Swift*).

EXPLA'NATORY. *a.* (from *explain.*) Containing explanation (*Swift*).

E'XPLETIVE. *s.* (*expletivum*, Lat.) Something used only to take up room (*Swift*).

E'XPLICABLE. *a.* (from *explicate*,) Explainable; possible to be explained (*Hale*).

To **E'XPLICATE.** *v. a.* (*explico*, Latin.) 1. To unfold; to expand (*Blackmore*). 2. To explain; to clear (*Taylor*).

EXPLICA'TION. *s.* (from *explicate.*) 1. The act of opening, unfolding, or expanding. 2. The act of explaining; interpretation; explanation (*Hooker*). 3. The sense given by an explainer (*Burnet*).

EXPLICATIVE. *a.* (from *explicate.*) Having a tendency to explain (*Watts*).

EXPLICA'TOR. *s.* (from *explicate.*) Expounder; interpreter; explainer.

EXPLI'CIT. *a.* (*explicitus*, Latin.) Unfolded; plain; clear; not merely implied (*Burnet*).

EXPLI'CITLY. *ad.* Plainly; directly; not merely by inference (*Govern. of the Tongue*).

To **EXPLO'DE.** *v. a.* (*explodo*, Lat.) 1. To drive out disgracefully with some noise of contempt (*Roscommon*). 2. To drive out with noise and violence, as from a gun (*Blackmore*).

EXPLO'DER. *s.* (from *explode.*) A hisser; one who drives out with open contempt.

EXPLO'IT. *s.* (*expletum*, Lat.) A design accomplished; an achievement; a successful attempt (*Denham*).

To **Explo'it.** *v. a.* (from the noun.) To perform; to achieve: not used (*Camden*).

To **EXPLO'RATE.** *v. a.* (*exploro*, Latin.) To search out; to explore (*Brown*).

EXPLORA'TION. *s.* (from *explorate.*) Search; examination (*Brown*).

EXPLORA'TOR. *s.* (from *explorate.*) One who searches; an examiner.

EXPLO'RATORY. *a.* (from *explorate.*) Searching; examining.

To **EXPLO'RE.** *v. a.* (*exploro*, Latin.) To try; to search into; to examine by trial (*Boyle*).

EXPLO'REMENT. *s.* Search; trial (*Br.*).

EXPLOSION, in natural philosophy, a sudden and violent expansion of an aërial or other elastic fluid, by which it instantly throws off any obstacle that happens to be in the way, sometimes with incredible force, and in such a manner as to produce the most astonishing effects upon the neighbouring objects. Explosion differs from expansion, in that the latter is the effect of a gradual and continued power, acting uniformly for some time; whereas the former is always sudden, and only of momentary duration. The expansions of solid substances do not terminate in violent explosions, on account of their slowness, and the small space through which the metal, or other expanding substance, moves; though their strength may be equally great with that of the most active aërial fluids. Thus we find, that though wedges of wood, when wetted, will cleave solid blocks of stone, they never throw them to any distance, as is the case with gunpowder. On the other hand, it is seldom that the expansion of any elastic fluid bursts a solid substance, without throwing the fragments of it to a considerable distance, the effects of which are often very terrible. The reasons of this may be comprised in the two following particulars: 1. The immense velocity with which the aërial fluids expand, when affected by a considerable degree of heat; and, 2. Their celerity in acquiring heat and being affected by it, which is much superior to that of solid substances. Thus air, heated as much as iron when brought to a white heat, is expanded to four times its bulk; but the metal itself will not be expanded the 500th part of that space. In the case of gunpowder, which is a violent and well-known explosive substance, the velocity with which the flame moves is calculated by Mr. Robins, in his Treatise upon Gunnery, to be no less than 7000 feet in a second, or little less than 79 miles per minute. Hence the impulse of the fluid is inconceivably great, and the obstacles on which it strikes are hurried off with vast velocity, though much less than that just mentioned; for a cannon ball, with the greatest charge of powder that can be conveniently given, does not move at a greater rate than 2400 feet per second, or little more than 27 miles per minute. The velocity of the ball again is promoted by the sudden propagation of the heat through the whole body of air, as soon as it is extricated from the materials of which the gunpowder is made; so that it is enabled to strike all at once, and thus greatly to augment the momentum of the ball. It is evident that this contributes very much to the force of the explosion, by what happens when powder is wetted or mixed with any substance, which prevents it from taking fire all at once. In this case the force of the explosion, even when the same quantity of powder is made use of, is not to be compared to that of dry powder.

We may conclude, upon these principles, that the force of an explosion depends, 1. On the quantity of elastic fluid to be expanded; 2. On the velocity it acquires by a certain degree of heat; and, 3. On the celerity with which the degree of heat affects the whole of the expansile fluid. These three take place in the greatest perfection where the electric fluid is concerned, as in cases of lightning, earthquakes, and volcanoes.

Every one has heard of the prodigious effects of lightning when it happens to strike buildings, trees, or even the most solid rocks; and in some cases, where the quantity of electricity is still greater than in any flash of lightning, we hear of still more tremendous consequences ensuing. Dr. Priestley gives an instance of a large fire-ball rolling on the surface of the sea, which, after rising up to the top-mast of a ship of war, burst with such violence, that the explosion resembled the discharge of hundreds of cannons fired at once. Great damage was done by it; but there is not the least doubt that most of its force was spent on the air, or carried down to the sea by the mast and iron-work of the ship. Indeed, considering that in all cases a great part of the force of electric explosions is dissipated in this manner, it may justly be doubted whether they can be measured by any method applicable to the mensuration of other forces. Even in artificial electricity the force is prodigiously great, insomuch that Dr. Van Marum calculated that of the great battery belonging to the machine in Teyler's museum to be upwards of 900 pounds.

Whenever the electrical fluid acts like common fire, the force of the explosions, though exceedingly great, is capable of mensuration, by comparing the distances to which the bodies are thrown with their weight. This is most evident in volcanoes, where the projections of the burning rocks and lava manifest the greatness of the power, at the same time that they afford a method of measuring it. By means of the fire which kindles the volcanoes, the aërial fluids are suddenly restored to their elastic state; and not only so, but their natural elasticity is greatly augmented, so that the explosions take place with great violence. The case is the same with gunpowder. The reason of the extreme quickness of the explosion of gunpowder is, that it takes fire so readily by the intimate mixture and combustibility of all the materials. In volcanoes the explosions likewise follow one another very quickly, and are by no means inferior in strength to those of gunpowder; but here the quantity of vapour makes up for the comparative slowness with which it is affected by the heat. Thus, though we could not by any other means contrive to fire cannon in such quick succession as we can do with gunpowder, yet in the huge furnace of a volcano the elastic matter is supplied in such quantities, that the explosions are in a manner unremitting; and even in ordinary experiments the confinement of aërial vapours has often occasioned violent explosions in chemical vessels. Carbonic acid gas, though heavier than most of the other aerial fluids, yet by its expansion contributes equally to the force of the explosion, as is evident, in that of pulvis fulminans. This is compounded of sulphur, saltpetre, and salt of tartar. The latter we know contains much carbonic acid gas; and it is probable that the violence of the explosion is occasioned by this air; for it is said that the greater quantity of it the alkaline salt contains, the greater force does it explode with.

Next in strength to the aërial vapours are those of aqueous and other liquids. The most remarkable effects of these are observed in steam-engines; but there is one particular case from which it has been inferred that aqueous steam is vastly stronger than the flame of gunpowder. This is when water is thrown upon melted copper; for here the explosion is so strong as almost to exceed imagination; and the most terrible accidents have been known to happen from such a slight cause as one of the workmen spitting in the furnace where copper was melting. Here, however, it is most probable that a decomposition of the water takes place, and on this supposition, the phænomenon is easily solved. The water being thrown in substance upon the melted copper, is decomposed by the violent heat; and one part of it adheres to the metal, thus converting it into a kind of calx, while the other is converted into inflammable air, which expanding suddenly, throws the melted metal about with the greatest violence by means of its re-action.

In order to understand the manner in which this is accomplished, we must consider some of the principles of gunnery laid down by Mr. Robins. One of these is, that though the air, in cases of ordinary velocity, makes no great resistance, it is far otherwise where the velocity of the moving body becomes very great. In all cases of explosion also, there is in the first instance a vacuum made by the exploding fluid; and consequently the weight of the atmosphere is to be overcome, which amounts to about fifteen pounds on every square inch of surface. Supposing the surface of the exploding fluid then, or that of melted copper, to contain an area of four square inches, it meets with a resistance of sixty pounds from the atmosphere, and consequently communicates an equal pressure to the fluid metal. Even this must of consequence throw it about, unless the same pressure was exactly diffused over every part of the surface. But much more must this effect be increased by the immense velocity with which the fluid moves, and by which the resistance of the atmosphere is augmented in a prodigious degree. The elastic fluid generated is then confined not only by the fluid metal and sides of the furnace, but by the air itself, which cannot get out of the way, so that the whole resembles a cannon closed at the mouth, and filled with inflamed gunpowder. Hence not only the melted metal, but the furnace itself, and the adjacent walls of the building, are hurried off as they would be by the firing of a great quantity of gunpowder in a small space, and which is well known to produce analogous effects.

Dr. Black, in explaining the phænomenon in question, supposes that the mere heat of the metal applied to the aqueous steam produces the explosion; and in proof of this, alleges that copper imbibes a greater quantity of heat during fusion than any other metal. Aqueous steam, however, seems to be too slow for producing such sudden and violent effects. Explosions, it is true, will be occasioned by it, but then it must be confined for a very considerable time, whereas the effects of water thrown upon melted copper are instantaneous.

It must be observed, that in all cases where a very hot body is thrown upon a small quantity of water in substance, an explosion will follow; but here the water is confined, and suddenly rarefied into steam, which cannot get away without throwing off the body which confines it. Examples of this kind frequently occur where masons, or other mechanics, are employed in fastening cramps of iron into stones; where, if there happens to be a little water in the hole into which the lead is poured, the latter will fly out in such a manner as sometimes to burn them severely. Terrible accidents of this kind have sometimes happened in founderies, when large quantities of melted metal have been poured into wet moulds. In these cases, the sudden expansion of the aqueous steam has thrown out the metal with violence; and if any decomposition has taken place at the same time, so as to convert the aqueous into an aërial vapour, the explosion must be still greater.

To this last kind of explosion, we must refer that which takes place on pouring cold water into boiling or burning oil or tallow. Here the case is much the same whether we pour the oil on the water, or the water on the oil, In the former case, the water which lies at the bottom is rarefied into steam, and explodes; in the latter, it sinks down through the oil by its superior specific gravity, and explodes as it passes along. In either case, however, the quantity of aqueous fluid must be but small in proportion to that of the oil; a very great quantity would put out the flame, or destroy the heat, in whatever way we applied it.

Another kind of explosion is that which takes place in solid substances, where we can scarcely suppose either aqueous or aërial vapours to be concerned. The most remarkable of these are the volcanic bombs mentioned by sir William Hamilton in the great eruption of Vesuvius in 1779. They were large pieces of lava, which burst in pieces like bombs as they fell to the ground; but he does not inform us whether their bursting was attended with any great violence or not. Indeed, amidst such scenes of horror, and the continual tremendous explosions of the volcano, smaller phænomena of this kind would probably be overlooked.

The only other kind of explosion we have to take notice of, is that produced by hydrogen and oxygen gasses, when mixed together and set on fire. This differs from any of those hitherto considered, because in reality there is an absolute condensation, rather than an expansion, throughout the whole of the operation; and could the airs be made to take fire throughout their whole substance absolutely at the same instant, there would be no explosion, but only a sudden production of heat. From this cause also is derived a very singular phenomenon, taken notice of by Dr. Priestley in his experiments on that subject. Having inclosed several quantities of these gases in a copper vessel, firing them afterwards by the electric spark, he found that the force of the explosion was directed more towards one part of the vessel than another; least on that part where the electrical discharge was made, and most upon that which was farthest from it. This inequality was very considerable; insomuch that he could not repeat his experiments any number of times without injuring the vessel in that part which was farthest from the discharge. The reason he gives for this is, that the mixture was not fired at the same instant, but first at the place where the discharge was made. This first explosion would have acted equally upon all parts of the vessel, had it not been for the intervention of the air. By the first momentary explosion, however, the air in the farthest part of the vessel was condensed, so that the next explosion was made stronger, while the copper in the forepart of the vessel had the whole of this strong explosion to resist, the hinder part being but little concerned, as the air in it was condensed and reduced almost to a vacuum.

Though the phænomena of explosions are sometimes very destructive, they are likewise of considerable use in life, by removing obstacles which could scarcely be got the better of by any mechanical power whatever. The principal of these are the blowing up of rocks, the separating of stones in quarries, and other purposes of that kind. The destruction occasioned by them in times of war, and the machines formed upon the principle of explosion for the destruction of the human race, are well known; and if we cannot call these useful, some take them at least to be necessary evils. For the production of explosions, gunpowder is the only substance that has yet been found to answer.

EXPLO'SIVE. *a.* (from *explode.*) Driving out with noise and violence.

EXPONENT OF A POWER, in arithmetic and algebra, from *expono*, I express, the number which expresses the degree or elevation of the power; or which shews how often a given power is to be divided by its root before it be brought down to unity. The exponent of a square number or quantity is 2; of a cube 3; and so on. Exponents are also now used to denote roots, and like those of the powers, are set above and somewhat to the right-hand of these numbers to which they belong: thus the square, cube, and fourth root of *x*, are denoted by $a^{\frac{1}{2}}, a^{\frac{1}{3}}, x^{\frac{1}{4}}$.

The notation of powers and roots by the present way of exponents, has introduced a new and general arithmetic of exponents or powers; for hence powers are multiplied by only adding their exponents, divided by subtracting the exponents, raised to other powers, or roots of them extracted, by multiplying or dividing the exponent by the index of the power or root.

So $a^2 \times a^3 = a^5$, and $a^{\frac{1}{2}} \times a^{\frac{1}{4}} = a^{\frac{3}{4}}$;

$a^5 \div a^3 = a^2$, and $a^{\frac{3}{4}} \div a^{\frac{1}{2}} = a^{\frac{1}{4}}$;
the 2d power of a^3 is a^6,
and the 3d root of a^6 is a^2.

EXPONENT OF A RATIO, is, by some, understood as the quotient arising from the division of the antecedent of the ratio by the consequent: in which sense, the exponent of the ratio of 3 to 2 is $\frac{3}{2}$; and that of the ratio of 2 to 3 is $\frac{2}{3}$.

But others, and those among the best mathematicians, understand logarithms as the exponents of ratios; in which sense they coincide with the idea of measures of ratios, as delivered by Kepler, Mercator, Halley, Cotes, &c.

EXPONENTIAL CURVE, is one whose nature is defined or expressed by an exponential equation; as the curve denoted by $a^x = y$, or by $e^x = y$.

EXPONENTIAL EQUATION, is one in which is contained an exponential quantity: as the equation $a^x = b$, or $x^x = ab$, &c.

Exponential equations are commonly best resolved by means of logarithms, viz. first taking the log. of the given equation: thus, taking the log. of the equation $a^x = b$, it is $x \times$ log. of $a =$ log. of b; and hence $x = \frac{\text{log. } b}{\text{log. } a}$.

Also, the log. of the equation $x^x = ab$, is $x \times \text{log. } x = \text{log. } ab$; and then x is easily found by trial-and-error, or the double rule of position.

EXPONENTIAL QUANTITY, is that whose

power is a variable quantity; as the expression a^x, or x^x.

Exponential quantities are of several degrees and orders, according to the number of exponents or powers, one over another. Thus,

a^x is an exponential of the 1st order,

$a^{x^{y}}$, is one of the 2d order,

$a^{x^{y^{z}}}$ is one of the 3d order, and so on. See Bernouilli Oper. tom. i. p. 182, &c.

To EXPO'RT. *v. a.* (*exporto*, Latin.) To carry out of a country (*Addison*).

E'XPORT, *s.* (from the verb.) Commodity carried out in traffick.

The following is an account of the total official and real value of all goods imported into, and exported from, Great Britain, for three years ending 10th October, 1808, distinguishing the foreign and colonial merchandize from British products and manufactures.

There are, it is to be observed, no official returns of the real value of foreign goods, either imported or exported, but only of such British products and manufactures, as are chargeable with duty *ad valorem*. The values below stated are, however, calculated according to the best information which could be procured.

EXPORTS.	IMPORTS.		Years ending 10th October.	EXPORTS.	IMPORTS.	
	Official Value.				Real Value.	
	Foreign and Colonial Merchandize.	British Products and Manufactures.			Foreign and Colonial Merchandize.	British Produce and Manufactures.
l.	*l.*	*l.*		*l.*	*l.*	*l.*
22,058,003	8,395,269	24,947,782	1806	38,398,645	9,005,120	39,368,212
23,493,127	9,090,918	24,550,724	1807	40,947,300	9,679,652	39,041,854
20,707,323	6,680,024	21,025,538	1808	34,448,620	7,138,282	35,233,477

The above account is exclusive of the value of the imports and exports of Scotland, and likewise of the importations from China and the East Indies; the returns of which being made up and transmitted in annual periods, ending 5th January, are not yet received for the year 1808. The amount of both has, therefore, been omitted in the two preceding years of the account (1806 and 1807), in order to preserve the comparative view of one year with another.

On converting the totals of the accounts of the exports of France and America for 1800 and 1804 into British money, their respective amounts stand thus:

	l.
Exports of Great Britain in 1800	43,152,019
Exports of France in 1800 .	11,316,650
Exports of the American States in 1804	17,482,291

Had the comparison been made with the real value of the exports of Great Britain instead of the custom-house values, the superior extent of our foreign trade would have appeared still more striking.

EXPORTATION, the act of sending goods out of one country into another. In modern times it has been the principal object of commercial policy, in almost every country, to encourage exportation, except with respect to a few particular articles; the export of manufactured goods has been promoted with a view of encouraging the internal industry of the country, and the export of foreign produce, as a means of drawing wealth from other countries by the profits of the carrying trade The excess of the value of goods exported, beyond that of the imports, has usually been considered as a criterion of the profits which a country derives from foreign trade; but this is a very fallacious mode of determining a point of great importance; advantageous foreign trade might long exist, even if the imports constantly exceeded the value of the exports. The laws in force relating to exportation consist principally of prohibitory or restrictive regulations respecting bullion, corn, wool, machinery, and tools, used in various branches of manufactures, the exportation of which, it is thought, might diminish the necessary supply of provisions for the consumption of the country, or enable foreigners to rival valuable branches of its manufactures. The acts relative to the exportation of wool prohibit the exportation, not only of the article itself, but also of live sheep, rams, or lambs, from Great Britain, Ireland, Jersey, Guernsey, Alderney, Sark, or Man, on penalty of the forfeiture thereof, and of the ships conveying the same; also 3*l.* for every sheep, &c. and the offender to suffer three months solitary imprisonment; for a second offence 5*l.* per sheep, &c. and six months imprisonment: except wether sheep for ships' use only, put on board by licence of the port-officer of the customs. A limited quantity of wool is, however, permitted to be exported from the port of Southampton to Jersey, Guernsey, Alderney, and Sark. The duties on exportation, payable in Great Britain and Ireland, which were formerly the principal branch of the revenue derived from foreign trade, are now of small amount in comparison with the duties payable on goods brought into the country.

EXPORTER. *s.* (from *export.*) He that carries out commodities.

To EXPO'SE. *v. a.* (*expositum,* Latin.) 1. To lay open; to make liable to (*Prior*). 2. To put in the power of any thing (*Dryden*). 3. To lay open; to make bare (*Dryden*). 4. To lay open to censure or ridicule (*Dryden*). 5. To lay open to examination (*Locke*). 6. To put in danger (*Clarendon*). 7. To cast out to chance (*Prior*). 8. To censure; to treat with dispraise (*Addison*).

EXPOSING OF CHILDREN, a barbarous custom practised by most of the ancients, excepting the Thebans, who had an express law to the contrary, whereby it was made capital to expose children, ordaining, at the same time, that such as were not in a condition to educate them should bring them to the magistrates, in order to be brought up at the public expense. (Pott. Archæol. Græc. tom. ii. p. 333.) Among the other Greeks, when a child was born, it was laid on the ground; and if the father designed to educate his child, he immediately took it up; but if he forbore to do this, the child was carried away and exposed. Many persons exposed their children only because they were not in a condition to educate them, having no intention that they should perish. It was the unhappy fate of daughters especially to be thus treated, as requiring more charges to educate and settle them in the world than sons.

EXPOSITION. *s.* (from *expose.*) 1. The situation in which any thing is placed with respect to the sun or air (*Arbuthnot*). 2. Explanation; interpretation (*Dryden*).

EXPO'SITOR. *s.* (*expositor,* Latin.) Explainer; expounder; interpreter (*South*).

EX POST FACTO, in law, something done after another: thus an estate granted may be good by matter *ex post facto,* that was not so at first, as in case of election.

A law is said to be *ex post facto* when it is enacted to punish an offence committed before the passing of the law. Such a proceeding is held to be against the constitution of England.

To EXPO'STULATE. *v. a.* (*expostulo,* Lat.) To canvass with another; to altercate; to debate without open rupture (*Cotton*).

EXPOSTULA'TION. *s.* (from *expostulate.*) 1. Debate; altercation; discussion of an affair without rupture (*Spectator*). 2. Charge; accusation (*Waller*).

EXPOSTULA'TOR. *s.* One that debates with another without open rupture.

EXPO'STULATORY. *a.* (from *expostulate.*) Containing expostulation (*L'Estrange*).

EXPO'SURE. *s.* (from *expose.*) 1. The act of exposing or setting out to observation. 2. The state of being open to observation (*Shakspeare*). 3. The state of being exposed to any thing. 4. The state of being in danger (*Shakspeare*). 5. Exposition; situation (*Evelyn*).

To EXPO'UND. *v. a.* (*expono,* Latin.) 1. To explain; to clear; to interpret (*Raleigh*). 2. To examine; to lay open (*Hudibras*).

EXPO'UNDER. *s.* (from *expound.*) Explainer; interpreter (*Hooker*).

To EXPRE'SS. *v. a.* (*expressus,* Latin.) 1. To copy; to resemble; to represent (*Dryden*). 2. To represent by any of the imitative arts; as poetry, sculpture, painting (*Smith*). 3. To represent in words; to exhibit by language; to utter; to declare (*Milton*). 4. To show or make known in any manner (*Prior*). 5. To denote; to designate (*Numbers*). 6. To squeeze out; to force out by compression (*Bacon*). 7. To extort by violence (*Ben Jonson*).

Expre'ss. *a.* (from the verb.) 1. Copied; resembling; exactly alike (*Milton*). 2. Plain; apparent; in direct terms (*Ben Jonson*). 3. Clear; not dubious (*Stillingfleet*). 4. On purpose; for a particular end (*Atterbury*).

Expre'ss. *s.* (from the adjective.) 1. A message sent on purpose (*Clarendon*).

EXPRESSED OILS. Such oils as are obtained by pressing the substance containing them, as olives, which give out olive oil, almonds, &c.

EXPRESSION, in algebra, any algebraical quantity, simple or compound: as $4ab$, $3x \times cy$, or $\sqrt{a^2+x-y}$.

Expression, in music, denotes the performing of a piece with that peculiar energy and judgment, which are best calculated to excite the suitable emotions in the hearer.

Expression, in painting, a natural and lively representation of the subject, or of the several objects intended to be shown. The expression consists chiefly in representing the human body and all its parts, in the action suitable to it: in exhibiting in the face the several passions proper to the figures, and observing the motions they impress on the external parts. See Painting.

Expression, signifies farther, 4. The form or mode of language in which things are uttered. 5. A phrase; a mode of speech. 6. The act of squeezing or forcing out any thing by a press (*Arbuthnot*).

EXPRE'SSIVE. *a.* (from *express.*) Having the power of utterance or representation (*Pope*).

EXPRE'SSIVELY. *ad.* In a clear and representative way.

EXPRE'SSIVENESS. *s.* The power of expression, or representation by words (*Addison*).

EXPRE'SSLY. *ad.* (from *express.*) In direct terms; plainly; not by implication (*Stillingfleet*).

EXPRE'SSURE. *s.* (from *express:* not used.) 1. Expression; utterance (*Shakspeare*). 2. The form; the likeness represented (*Shakspeare*). 3. The mark; the impression (*Shakspeare*).

To EXPRO'BRATE. *v. a.* (*exprobro,* Lat.) To charge upon with reproach; to impute only with blame; to upbraid (*Brown*).

EXPROBRA'TION. *s.* (from *exprobrate.*) Reproachful accusation (*Hooker*).

To EXPRO'PRIATE. *v. a.* (*ex* and *proprius,* Latin.) To make no longer our own (*Boyle*).

To EXPU'GN. *v. a.* (*expugno,* Latin.) To conquer; to take by assault.

EXPUGNATION. *s.* (from *expugn.*) Conquest; the act of taking by assault (*Sandys*).

To EXPU'LSE. *v. a.* (*expulsus*, Latin.) To drive out; to expel; to force away (*Bacon*).

EXPU'LSION. *s.* (from *expulse.*) 1. The act of expelling or driving out (*Arbuthnot*). 2. The state of being driven out (*Raleigh*).

EXPU'LSIVE. *a.* (from *expulse.*) Having the power of expulsion (*Wiseman*).

EXPU'NCTION. *s.* (from *expunge.*) Abolition; the act of expunging, or effacing.

To EXPU'NGE. *v. a.* (*expugno*, Lat.) 1. To blot out; to rub out (*Swift*). 2. To efface; to annihilate (*Sandys*).

EXPURGA'TION. *s.* (*expurgatio*, Latin.) 1. The act of purging or cleansing (*Wiseman*). 2. Purification from bad mixture, as of errour or falsehood (*Brown*). 3. In astronomy. See Emersion.

EXPU'RGATOR. *s.* One who corrects by expunging (*Digby*).

EXPU'RGATORY. *a.* (*expurgatorius*, Lat.) Employed in purging away what is noxious (*Brown*).

E'XQUISITE. *a.* (*exquisitus*, Latin.) 1. Far-sought; excellent; consummate; complete (*Raleigh*). 2. Consummately bad (*K. Charles*). 3. Very sensibly felt (*Cheyne*).

EXQUI'SITELY. *ad.* Perfectly; completely.

E'XQUISITENESS. *s.* Nicety; perfection.

E'XSCRIPT. *s.* (*exscriptum*, Latin.) A copy; a writing copied from another.

EXSI'CCANT. *a.* (from *exsiccate.*) Drying; having the power to dry up (*Wiseman*).

To EXSI'CCATE. *v. a.* (*exsicco*, Lat.) To dry (*Mortimer*).

EXSICCA'TION. *s.* (from *exsiccate.*) The act of drying (*Brown*).

EXSI'CCATIVE *a.* (from *exsiccate.*) Having the power of drying.

EXSPUI'TION. (from *exspuo*, to spit out.) The discharge of mucus from the lungs or bronchia.

EXSTIPULATE, in botany, without stipules. As in many sorts of cistus, cardamine parviflora, &c.

EXSUCCOUS, in botany, juiceless, without juice; opposed to succulent. It respects the substance of leaves.

EXSU'CTION. *s.* (*exugo*, Lat.) The act of sucking out (*Boyle*).

EXSUDA'TION. *s.* (from *exudo*, Lat.) A sweating out; an extillation (*Derham*).

EXSUFFLA'TION. *s.* (*ex* and *sufflo*, Lat.) A blast working underneath (*Bacon*).

To EXSU'FFOLATE. *v. a.* (*suffolar*, Italian.) To whisper; to buzz in the ear (*Shakspeare*).

To EXSU'SCITATE. *v. a.* (*exsuscito*, Lat.) To rouse up; to stir up.

E'XTANCY. *s.* (from *extant.*) 1. The state of rising above the rest. 2. Parts rising up above the rest (*Boyle*).

E'XTANT. *a.* (*extans*, Latin.) 1. Standing out to view; standing above the rest (*Ray*). 2. Public; not suppressed (*Graunt*).

EXTA'TICAL. Exta'tic. *a.* (ἐκςατικὸς. See Ecstacy.) 1. Tending to something external (*Boyle*). 2. Rapturous (*Pope*).

EXTE'MPORAL. *a.* (*extemporalis*, Lat.) 1. Uttered without premeditation; quick; ready; sudden (*Wotton*). 2. Speaking without premeditation (*Ben Jonson*).

EXTE'MPORALLY. *ad.* (from *extemporal.*) Quickly; without premeditation (*Shakspeare*).

EXTEMPORA'NEOUS. *a.* (*extemporaneus*, Lat.) Unpremeditated; sudden.

EXTE'MPORARY. *a.* (*extemporarius*, Lat.) Uttered or performed without premeditation; sudden; quick (*More*).

EXTE'MPORE. *ad.* (*extempore*, Latin.) Without premeditation; suddenly; readily (*South*).

EXTE'MPORINESS. *s.* (from *extempore.*) The faculty of speaking or acting without premeditation.

To EXTE'MPORIZE. *v. n.* (from *extempore.*) To speak without premeditation (*South*).

To EXTE'ND. *v. a.* (*extendo*, Lat.) 1. To stretch out in any direction (*Pope*). 2. To amplify: opposed to *contract* (*Wotton*). 3. To spread abroad; to diffuse; to expand. 4. To widen to a large comprehension (*Locke*). 5. To stretch into assignable dimensions; to make local; to magnify so as to fill some assignable space (*Prior*). 6. To enlarge; to continue (*Pope*). 7. To increase in force or duration (*Shakspeare*). 8. To enlarge the comprehension of any position (*Hooker*). 9. To impart; to communicate (*Psalms*). 10. To seize by course of law (*Hudibras*).

To Exte'nd. *v. n.* To reach to any distance (*Graunt*).

EXTE'NDER. *s.* (from *extend.*) That by which any thing is extended (*Wiseman*).

EXTE'NDIBLE. *a.* (from *extend.*) Capable of extension (*Arbuthnot*).

EXTENSIBI'LITY. *s.* (from *extensible.*) The quality of being extensible (*Grew*).

EXTE'NSIBLE. *a.* (*extensio*, Latin.) 1. Capable of being stretched into length or breadth (*Holder*). 2. Capable of being extended to a larger comprehension (*Glanville*).

EXTE'NSIBLENESS. *s.* (from *extensible.*) Capacity of being extended.

EXTE'NSION. *s.* (from *extensio*, Lat.) 1. The act of extending. 2. The state of being extended (*Burnet*). 3. That essential property of a body by which it possesses or occupies some part of universal space, which is called the place of that body.

EXTE'NSIONAL. *a.* (from *extension.*) Long drawn out; having great extent (*More*).

EXTE'NSIVE. *a.* (*extensivus*, Latin.) 1. Wide; large (*Watts*). 2. That may be extended: not used (*Boyle*).

EXTE'NSIVELY. *ad.* Widely; largely (*Watts*).

EXTE'NSIVENESS. *s.* 1. Largeness; diffusiveness; wideness (*Watts*). 2. Possibility to be extended (*Ray*).

EXTE'NSOR. (*extensor*, from *extendo*, to stretch out.) A term in anatomy, given to those muscles whose office it is to extend any part; the term is in opposition to flexor.

EXTENSOR BRE'VIS DIGITO'RUM PEDIS. Extensor brevis of Douglas. A muscle of the toes situated on the foot. It arises fleshy and tendinous from the fore and upper part of the os calcis, and soon forms a fleshy belly, divisible into four portions, which send off an equal number of tendons that pass over the upper part of the foot under the tendons of the extensor longus digitorum pedis, to be inserted into its tendinous expansion. Its office is to extend the toes.

E. carpi radialis brevior. Radialis externus brevior of Albinus. Radialis secundus of Winslow. An extensor muscle of the wrist, situated on the fore-arm. It arises tendinous from the external condyle of the humerus, and from the ligament that connects the radius to it, and runs along the outside of the radius. It is inserted by a long tendon into the upper and back part of the metacarpal bone of the middle finger. It assists in extending and bringing the hand backward.

E. carpi radialis longior. Radialis externus longior of Albinus. Radialis externus primus of Winslow. An extensor muscle of the carpus, situated on the fore arm, that acts in conjunction with the former. It arises thin, broad, and fleshy, from the lower part of the external ridge of the os humeri, above its external condyle, and is inserted by a round tendon into the posterior and upper part of the metacarpal bone that sustains the fore fingers.

E. carpi ulnaris. Ulnaris externus of Albinus and Winslow. It arises from the outer condyle of the os humeri, and then receives an origin from the edge of the ulna: its tendon passes in a groove behind the styloid process of the ulna: to be inserted into the inside of the basis of the metacarpal bone of the little finger.

E. digitorom communis. A muscle situated on the fore-arm, that extends all the joints of the fingers. It arises from the external protuberance of the humerus: and at the wrist it divides into three flat tendons, which pass under the annular ligament, to be inserted into all the bones of the fore, middle, and ring fingers.

E. digitorum longus. See EXTENSOR LONGUS DIGITORUM PEDIS.

E. indicis. See INDICATOR.

E. longus digitorum pedis. Extensor longus of Douglas. A muscle situated on the leg, that extends all the joints of the four small toes. It arises from the upper part of the tibia and fibula, and the interosseous ligament; its tendon passes under the annular ligament, and then divides into five, four of which are inserted into the second and third phalanges of the toes, and the fifth goes to the basis of the metatarsal bone. This last Winslow reckons a distinct muscle, and calls it peronæus brevis.

E. longus pollicis pedis. See EXTENSOR PROPRIUS POLLICIS PEDIS.

E. magnus. See GASTROCNEMIUS INTERNUS.

E. major pollicis manus. See EXTENSOR SECUNDI INTERNODII.

E. minor pollicis manus. See EXTENSOR PRIMI INTERNODII.

E. ossis metacarpi pollicis manus. Abductor longus pollicis manus of Albinus. Extensor primi internodii of Douglas. It arises fleshy from the middle and posterior part of the ulna, from the posterior part of the middle of the radius, and from the interosseous ligament, and is inserted into the os trapezium, and upper part of the metacarpal bone of the thumb.

E. pollicis primus. See EXTENSOR PRIMI INTERNODII.

E. pollicis secundus. See EXTENSOR SECUNDI INTERNODII.

E. primi internodii. Extensor minor pollicis manus of Albinus. This muscle, and the extensor ossis metacarpi pollicis manus, are called extensor pollicis primus by Winslow, and extensor secundi internodii by Douglas. A muscle of the thumb, situated on the hand, that extends the first bone of the thumb obliquely outwards. It arises fleshy from the posterior part of the ulna, and from the interosseous ligament, and is inserted tendinous into the posterior part of the first bone of the thumb.

E. proprius pollicis pedis. Extensor longus pollicis pedis of Douglas. An extensor muscle of the great toe, situated on the foot. It arises by an acute, tendinous, and fleshy beginning, some way below the head and anterior part of the fibula, along which it runs to near its lower extremity, connected to it by a number of fleshy fibres, which descend obliquely, and form a tendon which is inserted into the posterior part of the first and last joint of the great toe.

E. secundi internodii. Extensor major pollicis manus of Albinus. Extensor pollicis secundus of Winslow. Extensor tertii internodii of Douglas. A muscle of the thumb, situated on the hand, that extends the last joint of the thumb obliquely backwards. It arises tendinous and fleshy from the middle part of the ulna, and the interosseous ligament; it then forms a tendon, which runs through a small groove at the inner, and back part of the radius to be inserted into the last bone of the thumb.

E. secundi internodii indicis proprius. See INDICATOR.

E. tarsi minor. See PLANTARIS.

E. tarsi suralis. See GASTROCNEMIUS INTERNUS.

E. tertii internodii minimi digiti. See ABDUCTOR MINIMI DIGITI MANUS.

E. tertii internodii indicis. See PRIOR INDICIS.

E. mallei. See LAXATOR TYMPANI.

EXTE'NT. *part.* Extended (*Spenser*).

EXTE'NT. *s.* (*extensus*, Latin.) 1. Space or degree to which any thing is extended (*Milton*). 2. Bulk; size; compass (*Milton*). 3. Communication; distribution (*Shakspeare*). 4. Execution; seizure (*Shakspeare*).

EXTENT, in law, is used in a double sense: sometimes it signifies a writ or command to the sheriff for the valuing of lands or tenements; and sometimes the act of the sheriff, or other commissioner, upon this writ; but most commonly it denotes an estimate or valuation of lands, and hence come our extended or rack rents. Every extent ought to be made on inquisition and verdict, without which the sheriff cannot legally execute the writ.

To **EXTE′NUATE.** *v. a.* (*extenuo*, Lat.) 1. To lessen; to make small in bulk (*Grew*). 2. To lessen; to diminish in any quality (*Dryden*). 3. To lessen; to degrade (*Milton*). 4. To lessen; to palliate (*Milton*). 5. To make lean.

EXTENUA′TION. *s.* (from *extenuate.*) 1. The act of representing things less ill than they are; palliation. 2. Mitigation; alleviation of punishment (*Atterbury*). 3. A general decay in the muscular flesh of the whole body (*Quincy*).

EXTE′RIOR. *a.* (*exterior*, Lat.) Outward; external; not intrinsic (*Boyle*).

EXTE′RIORLY. *ad.* Outwardly; externally.

To **EXTE′RMINATE.** *v. a.* (*extermino*, Lat.) To root out; to tear up; to drive away; to abolish; to destroy (*Bentley*).

EXTERMINA′TION. *s.* (from *exterminate.*) Destruction; excision (*Bacon*).

Extermination, or Exterminating, in algebra, is used for taking away. Thus algebraists speak of exterminating surds, fractions, or any particular letter, out of an equation.

Different rules of extermination are necessary, according to the forms of the equation, and the number of unknown quantities: some of the best may be found in Maclaurin's and Emerson's Algebra, and our article ALGEBRA.

EXTERMI′NATOR. *s.* (*exterminator*, Lat.) That by which any thing is destroyed.

To **EXTER′MINE.** *v. a.* (*extermino*, Lat.) To exterminate: not used (*Shakspeare*).

EXTE′RN. *a.* (*externus*, Lat.) 1. External; outward; visible (*Shakspeare*). 2. Without itself; not inherent; not intrinsic: not depending on itself (*Digby*).

EXTE′RNAL. *a.* (*externus*, Lat.) 1. Outward; not proceeding from itself: opposite to *internal* (*Tillotson*). 2. Having the outward appearance (*Stillingfleet*).

EXTE′RNALLY. *ad.* Outwardly (*Taylor*).

To **EXTI′L.** *v. n.* (*ex* and *stillo*, Latin.) To drop or distil from.

EXTILLA′TION. *s.* (from *ex* and *stillo*, Lat.) The act of falling in drops (*Derham*).

To **EXTI′MULATE.** *v. a.* (*extimulo*, Lat.) To prick; to incite by stimulation (*Brown*).

EXTIMULA′TION. *s.* (from *extimulatio*, Lat.) Pungency; power of exciting motion or sensation (*Bacon*).

EXTI′NCT. *a.* (*extinctus*, Latin.) 1. Extinguished; quenched; put out (*Pope*). 2. At a stop; without progressive succession (*Dryden*). 3. Abolished; out of force (*Ayliffe*).

EXTI′NCTION. *s.* (*extinctio*, Lat.) 1. The act of quenching or extinguishing. 2. The state of being quenched (*Harvey*). 3. Destruction; excision (*Rogers*). 4. Suppression (*Thomson*).

To **EXTI′NGUISH.** *v. a.* (*extinguo*, Lat.) 1. To put out; to quench (*Dryden*). 2. To suppress; to destroy (*Hayward*). 3. To cloud; to obscure (*Shakspeare*).

EXTI′NGUISHABLE. *a.* (from *extinguish.*) That may be quenched, or destroyed.

EXTI′NGUISHER. *s.* (from *extinguish.*) A hollow cone put upon a candle to quench it.

EXTI′NGUISHMENT. *s.* 1. Extinction; suppression; act of quenching; destruction (*Davies*). 2. Abolition; nullification (*Hooker*). 3. Termination of a family (*Davies*).

Extinguishment, in law, wherever a right, title, or interest is destroyed, or taken away by the act of God, operation of law, or act of the party, this is called an extinguishment.

Of the extinguishment of rents.—If a lessor purchases the tenantcy from his lessee, he cannot have both the rent and the land; nor can the tenant be under any obligation to pay the rent when the land, which was the consideration thereof, is returned by the lessor into his own hands; and this resumption or purchase of the tenantcy makes what is properly called an extinguishment of the rent.

As to the extinguishment of copyholds, it is laid down as a general rule, that any act of the copyholder, which denotes his intention to hold no longer of his lord, amounting to a determination of his will, is an extinguishment of his copyhold. (*Hutt* 81.)

Of the extinguishment of common.—If a commoner release his common in one acre, it is an extinguishment of the whole common. (*Show.* 350.)

Of the extinguishment of debts.—A creditor's accepting a higher security than he had before, is an extinguishment of the first debt; as if a creditor by simple contract accepts an obligation, this extinguishes the simple-contract debt. (1 *Rol. Abr.* 470 *and* 471.)

To **EXTI′RP.** *v. a.* (*extirpo*, Lat.) To eradicate; to root out: not used (*Shakspeare*).

To **EXTI′RPATE.** *v. a.* (*extirpo*, Lat.) To root out; to eradicate; to exscind (*Locke*).

EXTIRPA′TION. *s.* (from *extirpate.*) Eradication; excision; destruction (*Tillotson*).

EXTIRPA′TOR. *s.* (from *extirpate.*) One who roots out; a destroyer.

EXTISPEX, in antiquity, the person who drew presages from viewing the entrails of animals offered in sacrifice.

EXTISPI′CIOUS. *a.* (*extispicium*, Latin.) Augurial; relating to the inspection of entrails in order to prognostication (*Brown*).

To **EXTO′L.** *v. a.* (*extollo*, Lat.) To praise; to magnify; to laud; to celebrate (*Dryden*).

EXTO′LLER. *s.* A praiser; a magnifier.

EXTO′RSIVE. *a.* (from *extort.*) Having the quality of drawing by violent means.

EXTO′RSIVELY. *ad.* In an extorsive manner; by violence.

To **EXTO′RT.** *v. a.* (*extorqueo*, *extortus*

Lat.) 1. To draw by force; to force away; to wrest; to wring from one (*Rowe*). 2. To gain by violence or oppression (*Spenser*).

To **EXTO'RT.** *v. n.* To practise oppression and violence: not in use (*Davies*).

EXTO'RTER. *s.* One who practises oppression or extortion (*Camden*).

EXTO'RTION. *s.* (from *extort.*) 1. The act or practice of gaining by violence and rapacity (*Davies*). 2. Force by which any thing is unjustly taken away (*King Charles*).

EXTORTION, in law, signifies any oppression by colour or pretence of right; and in this respect it is said to be more heinous than robbery itself, as also that it is usually attended with the aggravating sin of perjury. (*Co. Lit.* 368.)

At common law extortion is severely punishable at the king's suit by fine and imprisonment, and by a removal from the office in the execution whereof it was committed. (31 Eliz. c. 5.) And this statute adds a greater penalty than the common law gave; for hereby the plaintiff shall recover his double damages. (2 *Inst.* 210.) See COLOUR OF OFFICE.

EXTO'RTIONER. *s.* (from *extortion.*) One who practises extortion (*Camden*).

To **EXTRA'CT.** *v. a.* (*extractum*, Lat.) 1. To draw out of something (*Bacon*). 2. To draw by chemical operation (*Philips*). 3. To take from something (*Milton*). 4. To draw out of any containing body or cavity (*Burnet*). 5. To select and abstract from a larger treatise (*Swift*).

E'XTRACT. *s.* (from the verb.) 1. The substance extracted; the chief parts drawn from any thing (*Boyle*). 2. The chief heads drawn from a book; an abstract; an epitome (*Camden*).

EXTRACT (Vegetable), *l'extractif*, Fr. *extract-auszug*, German. We must distinguish between this term as used for ages in pharmacy, and as lately applied to describe a peculiarly property of vegetables in the language of modern chemistry.

In the former sense, extract implies a substance of any kind extracted from the heterogeneous mass of vegetable matter, by the action of any menstruum, and reduced to a consistent form by the evaporation of that menstruum. Pharmaceutic extracts generally consist of gum, sugar, chemical extract, or extractive, tannin, cinchonin, gallic acid, or resin, or of several of these mixed in different proportions. The menstrua most commonly employed are water and alcohol. The former is capable of extracting all these substances, except the resin, and the latter all except the gum. As extract, however, under this signification is a direct branch, and constitutes a distinct section of PHARMACY, we refer to that article for a more minute developement of its scope and manipulations.

In a chemical view, extract or extractive is a term designed to express a distinct principle which there is reason to suppose exists in all vegetables, which possesses characteristic properties that distinguish it from mucilage, resin, and gums, or other parts of vegetable matter, and which constitutes a very large portion of pharmaceutic extract from whatever plants or parts of plants it may be procured.

Chemistry is indebted to Fourcroy for a very valuable research into the chemical nature of extract, contained in his elaborate analysis of the cinchona of St. Domingo; and to Vauquelin for an excellent enquiry into the same subject, connected with the analysis of the sap and native juices of the succulent plants.

Fourcroy boiled sixteen ounces of cinchona, reduced to a powder, twelve times successively for a quarter of an hour, in about twenty-six pounds of water each time. The first decoction was of a deep brown red, very bitter, and strongly frothed in boiling. It yielded by evaporation in a gentle heat five or seven grains of a brown dry extract. The second decoction was much less coloured, and gave only nine drams of extract: the third gave only two grains; and the sensible qualities of each decoction regularly diminished to the twelfth, which was little else than pure water. The entire quantity of extract obtained was nine ounces, fifty-six grains; which by being submitted to the action of alcohol, and an additional series of boilings, gave as follows:

	oz.	drs.	grs.
Mucilage	1	1	0
Crystalline grains separated from an alcoholic solution .	0	1	0
Flosculi separated by adding water to the solution . . .	0	1	12
Red powder insoluble in alcohol	0	2	0
Extract left at last	7	0	44
Loss	0	3	0
	9	0	56

Such are the general properties of the extract obtained from a decoction of Peruvian bark; and they will apply with some latitude to that of most other barks and woods. With many, however, a large portion of tan is mixed, which may be separated by a solution of isinglass or any other gelatin.

The properties of the extract contained in the native juices of plants are probably in a purer state; at least, being in a state of solution, all the changes liable to be produced by decoction with water are avoided. The experiments of Vauquelin on this subject are of high importance. When the sap of any tree is first drawn, it is always colourless or nearly so, but in the process of evaporation invariably becomes brown; and a certain though small quantity of pulverulent insoluble brown or red matter is precipitated. The extract obtained by evaporation to dryness is always a very mixed substance, containing often tan, often saccharine mucilage, and always several earthy and saline matters, among which are lime, potash, acetous acid, and generally ammonia. The existence of acetous acid in all extracts whatever is ascertained by pouring a few drops of sulphuric acid upon them, which immediately produces a pungent agreeable vapour of acetous acid, and with sufficient quantities this acid may be collected in a receiver. Ammonia is also discovered in extracts, for if some quick lime be rubbed with any of them, the vapour of this alkali immediately arises. All the extracts made by water constantly attract moisture from the air, whereby in no great length of time they grow mouldy, to the great detriment of their medicinal virtues. This disposition to moisture is doubtless principally owing (as Vauquelin has observed) to the acetite of potash and ammonia which they contain, and which are very deliquescent salts.

All the soft extracts have also an excess of this acid, and hence they invariably redden litmus. Extracts appear to form a great portion of the colouring matter of vegetables, the affinity of which with different mordants has been amply detailed under the article DYEING. Thus if a solution of alum be added to any extract dissolved in water, a copious coloured precipitate is formed, insoluble in water, and consisting of extract intimately combined with alumine, whilst the supernatant liquor is rendered nearly colourless. Most of the metallic salts also occasion a precipitate, consisting of the extract with the metallic oxyd. The colour of the greater number of extracts is brown, red, or fawn.

From the foregoing observations, it appears to be as clearly demonstrated as in any other case of vegetable analysis (in itself difficult and complicated) that there exists a peculiar and immediate vegetable principle to which the term extract may be given, that it is almost invariably contained in greater or less degree in the part which is soluble in water, that it is naturally colourless when in solution in the vegetable juices, but when condensed in the solid parts, or when exposed to air or to heat, it always becomes more or less brown and coloured; that it is freely miscible with water in the state of colourless solution, but when altered by long exposure to heat and moisture, it becomes scarcely soluble in cold water, and much of it spontaneously separates from its solution by hot water, in proportion as it parts with heat; that it has a very strong affinity for alumine and metallic oxyds, separating them from their respective solutions, and forming compounds scarcely decomposable but by the agency of fire; and lastly, that it is found by destructive distillation to be composed of carbon, oxygen, and hydrogen; and probably a small portion of azot. These chemical properties are sufficient to distinguish it from every other of the immediate vegetable principles; but to them is added, by some acute and excellent chemists, another characteristic, namely, a strong affinity for oxygen, to which the colouring and difficult solubility in water are attributed. This character, however, cannot be admitted without some limitations.

When a colourless juice, such as the sap of any tree, is heated in an evaporating vessel, it gradually becomes of a dark brown, owing, as it is said, to the oxygen which the extract absorbs from the air. This opinion is certainly of itself sufficiently probable; but it also appears that the same change of colour takes place in vessels nearly closed as soon as the juice becomes heated, for Vauquelin adduces this as a convincing argument to shew that it does not depend on a concentration of the extract. But it is difficult to conceive how sufficient oxygen should be acquired for this purpose from the narrow aperture of a vessel through which a quantity of heated vapour must be constantly expelled; and if the first change will take place independent of the effect of the external air, it deserves inquiry by experiment, whether an extract similar to that produced by evaporation in open vessels would not be obtained by the same process in closed vessels. Again, the chief argument adduced for the successive oxygenation of extract, is the formation of the red brown pulverulent, and sometimes crystalline deposit, from the watery solution of extract after long evaporation in open vessels, confirmed by the immediate production of a similar deposit by the oxymuriatic acid. But it has not yet been at all proved by analysis that this deposit differs from extract in no other circumstance than in an increased quantity of oxygen. The exact nature of this singular product still requires further explanation; but it appears to be a very intimate union of vegetable matter with lime, for when calcined, the residue is chiefly carbonat of lime. Neither is the production of this substance by passing oxymuriatic acid through a solution of brown extract conclusive of its being generated by the simple union of oxygen with extract, without being confirmed by a full examination of the solution that remains, and a proof that all the oxygen of the acid had passed into the red powder, and into that only. It cannot be doubted that in the course of common evaporation of the decoction or infusion of extract, the length of time to which it is exposed to air much influences the quantity of this supposed oxygenated extract; but though the above-mentioned eminent chemists express their full conviction that the whole extract might be successively changed in this manner, it does not appear that they have ever effected this change, even on any considerable portion of the extract, for in the experiments with oxymuriatic acid, after this had been added to full saturation, only thirty grains of the red powder could be obtained from seventy-two of the extract. This opinion, therefore, of the spontaneous oxygenation of extract, though ingenious, and by no means improbable, must still be considered as extremely hypothetical, and cannot be yet admitted as a distinctive character of this vegetable principle.

Much variety is found in the sensible properties of colour and taste, in the different extracts. The colour is generally brown or red with various modifications, and it is quite a characteristic of all the solid extracts to be deeply coloured, in which respect they differ essentially from mucilage, fecula, and many other vegetable principles.

Bitterness of taste is a much less constant character, and is even entirely absent from a very large number of individual extracts.

After all that has been done on this subject, there is strong reason to suspect that this substance is one of those which the most easily enters into combinations with all the other vegetable principles, and probably unites with them so strongly, that no chemical process has ever succeeded in producing it pure and unmixed.

EXTRA'CTION. *s.* (*extractio*, Latin.) 1. The act of drawing one part out of a compound (*Bacon*). 2. Derivation from an original; lineage; descent (*Clarendon*).

EXTRACTION OF ROOTS, in arithmetic and algebra, the method of ascertaining the roots of given numbers or quantities. These roots are denominated from their powers, as the square, or 2d root; the cube, or 3d root; the biquadratic, or 4th root, &c. which are the roots of the 2d, 3d, 4th, &c. powers.

In the business of extraction no determinate roots can be obtained, unless the number whose root is required is a perfect power of that order which corresponds with the order of the root. Thus we can determine accurately both the square and cube root of 64; because it is both a square and a cube number: we can likewise find the square root of 81, and the cube root of 27; but the cube root of 81, and the square root of 27, are surd or indeterminate: though we can approximate to them nearer than by any assignable difference.

To extract the cube, or any higher root, of a number. In books of arithmetic, separate rules are given for the extraction of the cubic, and some higher roots; but they are so exceedingly tedious and difficult in their operation, that many mathematicians, of the greatest eminence, have invented approximating rules less difficult in use. Of these, none which we have seen is so simple in its form, and so well adapted for general practice, as that first given by Dr. Hutton in his Tracts, vol. i. p. 49, which is as follows: Let N be any number or power whose nth root is to be extracted; and let R be the nearest rational root of N, of the same kind, or R^n the nearest rational power to N, either greater or less than it; then shall the true root be very nearly equal to

$$\frac{\overline{n+1}.N+\overline{n-1}.R^n}{\overline{n-1}.N+\overline{n+1}.R^n}\times R;$$ which rule is general

for any root whose index is denoted by n. And, expounding n successively by the numbers 2, 3, 4, &c. this theorem furnishes the following particular formulæ for the several roots, viz. the

2d or square root $\dfrac{3N+R^2}{N+3R^2}\times R;$

3d or cube root $\dfrac{4N+2R^3}{2N+4R^3},\times R$, or $\dfrac{2N+R^3}{N+2R^3}\times R;$

4th root $\dfrac{5N+3R^4}{3N+5R^4}\times R;$

5th root $\dfrac{6N+4R^5}{4N+6R^5}\times R$, or $\dfrac{3N+2R^5}{2N+3R^5}\times R;$

6th root $\dfrac{7N+5R^6}{5N+7R^6}\times R;$

7th root $\dfrac{8N+6R^7}{6N+8R^7}\times R$, or $\dfrac{4N+3R^7}{3N+4R^7}\times R$

&c.

Or the theorem may be stated in the form of a proportion, thus:

as $\overline{n-1}.N+\overline{n+1}.R^n:\overline{n+1}.N+\overline{n-1}.R^n::R:$ the root sought very nearly.

For ex. suppose the problem proposed, of doubling the cube, or to find the cube root of the number 2. Here $N=2$, $n=3$, and the nearest power, and root too, is 1:

Hence $2N+R^3=4+1=5$,
and $N+2R^3=2+2=4$;

then $4:5::1:\frac{5}{4}=1{\cdot}25$ the first approximation.

Again, taking $R=\frac{5}{4}$, and conseq. $R^3=\frac{125}{64}$:

Hence $2N+R^3=4+\frac{125}{64}=\frac{381}{64}$:
and $N+2R^3=2+\frac{250}{64}=\frac{378}{64}$;

then $378:381::\frac{5}{4}:\frac{635}{504}=1{\cdot}259921$, for the cube root of 2, which is exact in the very last figure.

And again by taking $\frac{635}{504}$ for the value of R, a great many more figures may be found. For other methods of extraction, see our articles ALGEBRA, ARITHMETIC, and ROOTS.

EXTRACTION, in surgery, is the drawing any foreign matter out of the body by the hand, or by the help of instruments. See SURGERY.

EXTRACTOR. *s.* (Latin.) The person or instrument by which any thing is extracted. In midwifery, it is an instrument or forceps for extracting a child by the head in difficult cases. See MIDWIFERY.

EXTRADI'CTIONARY. *a.* (*extra* and *dictio*, Latin.) Not consisting in words, but realities (*Brown*).

EXTRADOS, in architecture, the exterior curvature or line of an arch. Sometimes it is used to denote the outer line of the structure, as the road-way in a bridge; but it is often employed to signify only the upper curve of the voussoirs. Writers on the theory of arches use it to signify the exterior curve appropriated to a given interior one or *intrados*, so that the whole shall form an arch of equilibration.

EXTRAFOLIACEOUS STIPULES. In botany. Growing on the outside of the leaves, or below them. Infra folium collocatæ. As in betula, tilia, and the class diadelphia. Opposite to intra-foliaceous. It is applied also to peduncles, and prickles.

EXTRAJUDI'CIAL. *a.* (*extra* and *judicium*, Latin.) Out of the regular course of legal procedure (*Ayliffe*).

EXTRAJUDI'CIALLY. *ad.* In a manner different from the ordinary course of legal procedure (*Ayliffe*).

EXTRAMI'SSION. *s.* (*extra* and *mitto*, Latin.) The act of emitting outward (*Brown*).

EXTRAMUNDA'NE. *a.* (*extra* and *mundus*, Latin.) Beyond the verge of the material world (*Glanville*).

EXTRA'NEOUS. *a.* (*extraneus*, Latin.) Not belonging to any thing; foreign; of different substance; not intrinsick (*Woodward*).

EXTRAORDINARII, amongst the Romans, was a body of men consisting of a third part of the foreign horse and a fifth of the foot, which was separated from the rest of the forces borrowed from the confederate states, with great policy and caution, to prevent any design that they might possibly entertain against the natural forces. A more choice body of men were drawn from among the extraordinarii under the name of ablecti.

EXTRAO'RDINARILY. *ad.* 1. In a manner out of the common method and order (*Hooker*). 2. Uncommonly; particularly; eminently; remarkably (*Howel*).

EXTRAO'RDINARINESS. *s.* (from *extraordinary*.) Uncommonness; eminence; remarkableness (*Government of the Tongue*).

EXTRAO'RDINARY. *a.* (*extraordinarius*, Latin.) 1. Different from common order and method; not ordinary (*Davies*). 2. Different from the common course of law (*Clarendon*). 3. Eminent; remarkable; more than common (*Stillingfleet*).

EXTRAO'RDINARY. *ad.* Extraordinarily.

EXTRAPARO'CHIAL. *a.* (*extra* and *parochia*, Latin.) Not comprehended within any parish.

EXTRAPROVI'NCIAL. *a.* (*extra* and *provincia*, Latin.) Not within the same province (*Ayliffe*).

EXTRARE'GULAR. *a.* (*extra* and *regula*, Latin.) Not comprehended within a rule (*Taylor*).

EXTRA'VAGANCE. EXTRA'VAGANCY. *s.* (*extravagans*, Latin.) 1. Excursion or sally beyond prescribed limits (*Hammond*). 2. Irregularity; wildness. 3. Outrage; violence; outrageous vehemence (*Tillotson*). 4. Unnatural tumour; bombast (*Dryden*). 5. Waste; vain and superfluous expence (*Arbuthnot*).

EXTRA'VAGANT. *a.* (*extravagans*, Lat.) 1. Wandering out of his bounds (*Shakspeare*). 2. Roving beyond just limits or prescribed methods (*Dryden*). 3. Not comprehended in any thing (*Ayliffe*). 4. Irregular; wild (*Milton*). 5. Wasteful; prodigal; vainly expensive (*Addison*).

EXTRA'VAGANT. *s.* One who is confined in no general rule or definition (*L'Estrange*).

EXTRAVAGANTES, those decretal epistles which were published after the Clementines. They were so called, because at first they were not digested or ranged with the other papal constitutions, but seemed to be, as it were, detached from the canon-law. They continued to be called by the same name when they were afterwards inserted in the body of the canon-law. The first extravagantes are those of John XXII. successor of Clement V. The last collection was brought down to the year 1483, and was called the common extravagantes, notwithstanding that they were likewise incorporated with the rest of the canon-law.

EXTRA'VAGANTLY. *ad.* 1. In an extravagant manner; wildly (*Dryden*). 2. In an unreasonable degree (*Pope*). 3. Expensively; luxuriously; wastefully.

EXTRA'VAGANTNESS. *s.* (from *extravagant*.) Excess; excursion beyond limits.

To EXTRA'VAGATE. *v. n.* (*extra* and *vagor*, Latin.) To wander out of limits.

EXTRA'VASATED. *a.* (*extra* and *vasa*, Latin.) Forced out of the properly containing vessels (*Arbuthnot*).

EXTRAVASA'TION. (*extravasatio*, from *extra*, without, and *vas*, a vessel.) See ECCHYMOMA.

EXTRAVE'NATE. (*extra* and *vena*, Lat.) Let out of the veins (*Glanville*).

EXTRAVE'RSION. *s.* (*extra* and *versio*, Latin.) The act of throwing out; the state of being thrown out (*Boyle*).

EXTRA'UGHT. *part.* Extracted (*Shak.*).

EXTRE'ME. *a.* (*extremus*, Latin.) 1. Greatest; of the highest degree (*Deuteronomy*). 2. Utmost (*Shakspeare*). 3. Last; that beyond which there is nothing (*Dryden*). 4. Pressing in the utmost degree (*Hooker*). 5. Rigourous; strict (*Psalms*).

EXTRE'ME. *s.* (from the adjective.) 1. Utmost point; highest degree of any thing (*Milton*). 2. Points at the greatest distance from each other; extremity (*Locke*).

EXTREME AND MEAN PROPORTION, in geometry, is when a line is so divided that the whole line is to the greater segment, as that segment is to the other: or as it is expressed by Euclid, when the line is so divided, that the rectangle under the whole line and the less segment, is equal to the square of the greater segment.

EXTREMES, in logic, the two extreme terms of the conclusion of a syllogism; viz. the predicate and subject. They are called extremes from their relation to another term, which is a medium or mean between them. The predicate, as being likewise had in the first proposition, is called the *majus extremum*, greater extreme; and the subject, as being put in the second or minor proposition, is called the *minus extremum*, lesser extreme. Thus, in the syllogism, man is an animal; Peter is a man, therefore Peter is an animal; the word animal is the greater extreme, Peter the less extreme, and man the medium.

EXTREMES CONJUNCT, and EXTREMES DISJUNCT, in spherical trigonometry, are, the former the two circular parts that lie next the assumed middle part, and the latter are the two that lie remote from the middle part. These were terms applied by lord Napier, in his universal theorem for resolving all right-angled and quadrantal spherical triangles; for which see our article CIRCULAR PARTS.

EXTRE'MELY. *ad.* (from *extreme*.) 1. In the utmost degree (*Sidney*). 2. Very much; greatly (*Swift*).

EXTRE'MITY. *s.* (*extremitas*, Latin.) 1. The utmost point; the highest degree (*Hook.*). 2. The utmost parts; the parts most remote from the middle (*Brown*). 3. The points in the utmost degree of opposition (*Denham*). 4. Remotest parts; parts at the greatest distance (*Arbuthnot*). 5. Violence of passion (*Spenser*). 6. The utmost violence, rigour, or distress (*Clarendon*). 7. The most aggravated state (*Dryden*).

To EXTRICATE. *v. a.* (*extrico*, Latin.) To disembarrass; to set free any one in a state of perplexity; to disentangle (*Addison*).

EXTRICA'TION. *s.* (from *extricate.*) The act of disentangling; disentanglement (*Boyle*).

EXTRI'NSICAL. Extrinsic. *a.* (*extrinsicus*, Latin.) External; outward; not intimately belonging; not intrinsic (*Ray*).

EXTRI'NSICALLY. *ad.* (from *extrinsical.*) From without (*Glanville*).

To EXTRU'CT. *v. a.* (*extructum*, Latin.) To build; to raise; to form into a structure.

EXTRU'CTOR. *s.* (from *extruct.*) A builder; a fabricator; a contriver.

To EXTRU'DE. *v. a.* (*extrudo*, Latin.) To thrust off; to drive off (*Woodward*)

EXTRU'SION. *s.* (*extrusus*, Latin.) The act of thrusting or driving out (*Bacon*).

EXTU'BERANCE. *s.* (*ex* and *tuber*, Lat.) Knobs, or parts protuberant (*Moxon*).

EXU'BERANCE. *s.* (*exuberatio*, Latin.) Overgrowth; superfluous shoots; useless abundance; luxuriance (*Garth*).

EXU'BERANT. *a.* (*exuberans*, Latin.) 1. Growing with superfluous shoots; overabundant; superfluously plenteous (*Pope*). 2. Abounding in the utmost degree (*Boyle*).

EXU'BERANTLY. *ad.* Abundantly; to a superfluous degree (*Woodward*).

To EXU'BERATE. *v. n.* (*exubero*, Latin.) To abound in the highest degree (*Boyle*).

EXU'CCOUS. *a.* (*exsuccus*, Lat.) Without juice; dry (*Brown*).

EXUDA'TION. *s.* (from *exudo*, Lat.) 1. The act of emitting in sweat (*Wiseman*). 2. The matter issuing out by sweat from any body (*Bacon*)

To EXU'DATE. *To* Exu'de. *v. n.* (*exudo*, Latin.) To sweat out; to issue out by sweat (*Arbuthnot*).

To EXU'LCERATE. *v. a.* (*exulcero*, Latin.) 1. To make sore with an ulcer; to affect with a running or eating sore (*Ray*). 2. To afflict; to corrode; to enrage (*Milton*).

EXULCERA'TION, (*exulceratio*, from *exulcero*, to cause ulcers.) The same as ulcer, though occasionally applied to that species which is small and superficial.

EXU'LCERATORY. *a.* (from *exulcerate.*) Having a tendency to cause ulcers.

To EXU'LT. *v. n.* (*exulto*, Latin.) To rejoice above measure; to triumph (*Hooker*).

EXU'LTANCE. *s.* (from *exult.*) Transport; joy; triumph (*Gov. of the Tongue*).

EXULTA'TION. *s.* (*exultatio*, Latin.) Joy; triumph; rapturous delight (*Hooker*).

To EXU'NDATE. *v. a.* (*exundo*, Lat.) To overflow.

EXUNDA'TION. *s.* (from *exundate.*) Overflow; abundance (*Ray*).

EXU'PERABLE. *a.* (*exuperabilis*, Latin.) Conquerable; superable; vincible.

EXU'PERANCE. *s.* (*exuperantia*, Latin.) Overbalance; greater proportion (*Brown*).

To EXU'SCITATE. *v. a.* (*exsuscito*, Lat.) To stir up; to rouse.

EXU'STION. *s.* (*exustio*, Latin.) The act of burning up; consumption by fire.

EXU'VIÆ, (*exuviæ*, from *exuo*, to strip off.) The cuticle of the serpent, which is cast every spring. The word is also used to denote cast-off shells of some marine animals.

EY. ea, ee. May either come from ıȝ, an island, or from ea, which signifies a water, river, &c. or from ıeaȝ, a field (*Gibson*).

Ey, in old writers. See Eia.

EY'AS. *s.* (*niais*, French.) A young hawk just taken from the nest (*Shakspeare*).

EY'ASMUSKET. *s.* A young unfledged male hawk of the musket kind (*Shak.*).

EYE. *s.* plural *eyne*, now *eyes.* (eaȝ, Sax.) 1. The organ of vision (*Dryden*). 2. Sight; ocular knowledge (*Galatians*). 3. Look; countenance (*Shakspeare*). 4. Front; face (*Shakspeare*). 5. A posture of direct opposition (*Dryden*). 6. Aspect; regard (*Bacon*). 7. Notice; observation; watch (*Dryden*). 8. Opinion formed by observation (*Denham*). 9. Sight; view (*Shakspeare*). 10. Any thing formed like an eye (*Newton*). 11. Any small perforation (*South*). 12. Any small catch for a hook (*Boyle*). 13. Bud of a plant (*Evelyn*). 14. A small shade of colour (*Boyle*). 15. Power of perception (*Deuteronomy*).

To Eye. *v. a.* (from the noun.) To watch; to keep in view; to observe (*More*).

To Eye. *v. n.* To appear; to show; to bear an appearance: not used (*Shakspeare*).

Eye. *Oculus.* In anatomy, the eye or organ of vision, situated in a socket called the orbit, at the side of the root of the nose, which is composed of seven bones, viz. the frontal, superior maxillary, jugal, lachrymal, palatine, ethmoid, and sphænoid, which almost surround and defend it. Anatomists have divided the soft parts which form the eye into external and internal. The external parts are the *supercilia* or eyebrows, *palpelræ* or eyelids, *cilia*, or eyelashes, lachrymal gland, lachrymal caruncle, nasal duct, muscles of the bulb of the eye, and the fat of the orbit. The internal parts are those which form the bulb, or eye, properly so called; they consist of eight membranes, viz. the sclerotic, transparent cornea, the choroid membrane, iris, uvea, retina, hyaloid, and capsule of the crystalline lens; two chambers, one anterior, and the other posterior; and three humours, the aqueous, crystalline lens, and vitreous humour. The arteries of this viscus are the internal orbital, the central, and the ciliary. The veins empty themselves into the external jugulars. The nerves are the optic, and branches from the third, fourth, fifth, and sixth pair. The various parts are described under the different heads of Supercilia, Cilia, Sclerotic Membrane, Choroid, &c. The use of the eye is to form the organ of vision.

The whole structure and apparatus of the eye tend to this; that there be produced a distinct and vivid collection in the bottom of the eye, directly under the pupil, of the rays which proceeding from any point of an object and entering the eye, penetrate the crystalline humour; and that so many points be painted in the bottom of the eye as are conspicuous in an object, that so a small image similar to it may be represented on the retina.

In order to this, the rays from any radiant or reflecting point striking on the cornea are refracted towards the perpendicular, and thus determined to proceed through the aperture of the pupil to the surface of the crystalline; while other rays, which entered so obliquely as to be thrown upon the iris are reflected out again, that they may not disturb the distinctness of the sight; and others, whose less obliquity threw them between the uvea and vitreous humour, are extinguished in the darkness thereof, that none may be propagated through the vitreous but such as passing through the pupil strike on the crystalline.

In the mean time the iris, contracting by its circular, or dilating by its right fibres, the pupilla of the eye admits fewer or more rays, as the object is nearer or more vivid, or remoter, and more languid. See PUPIL.

Now the flatter the figure of the cornea is, the less does it collect the rays emitted from any lucid point; whence fewer arrive at the crystalline, and those more diverging, unless when they come from a very remote object: on the contrary, the rounder it is the more of the rays from any point does it collect, and throw on the crystalline, and those the more converging; whence one great cause of the defects in the eyes both of old men and myopes. Again, the rays transmitted through the pupil to the crystalline are there refracted anew, farther collected, and rendered converging; so that those which came from the same point of the object are now thrown in one point through the vitreous upon the retina, where they paint or exhibit that precise point of the object whence they flowed. Accordingly, if the crystalline be very dense or spherical, the focus, or the point wherein they are united, will be too near; and if too flat, or rare, the point will be too remote; the effect of both which is confusion. And hence another cause of the defects of myopes and presbytæ.

It is not, however, myopes and old men alone that would labour under these defects, and have their vision in most cases confused, as in objects very near or very remote, very small or very great; but this would be the common condition of vision. Distinct vision, depending absolutely on the union of all the rays coming from the same point of the object on the same precise point of the retina, and rays from the objects at different distances being united at different distances behind the crystalline; it were impossible, e. gr. for the same eye to see distinctly any two objects differently distant from it: but nature has made a provision against these defects; and that principally by bringing the crystalline nearer to the cornea, or farther from it, occasionally; which is effected two ways, viz. either by compressing the bulb of the eye by the four muscles, all strongly contracted at once, which changes the figure of the aqueous humour, and renders the eye oblong; or by the ligamentum ciliare augmenting and diminishing the convexity of the crystalline, and setting it nearer or farther from the retina. As complex as the mechanism of the eye may seem, and as manifold as the parts are which have a relation thereto, the justness of vision seems to require an exact habitude in them all: thus, though the pupil be no substantial part of the eye, but only an aperture of the uvea almost perpetually changing its bigness, according to the different degrees of light the eye chances to be exposed to; and therefore should seem, while this hole remains open, to perform its office, by giving entrance to the incident rays of light; yet Mr. Boyle saw a woman, who, after a fever, not being able to dilate the pupillæ of her eyes as before, though they were little narrower than ordinary, yet had she thereby almost lost her sight; and on the other side, though a competent wideness of the pupil be requisite to a clear and distinct vision, yet if its dilatation exceeds the due limits, there is thereby produced a considerable distemper of sight. It may seem also but a slight circumstance that the transparent coats of the eye should be devoid of colour, and of as little moment that the cornea should be very smooth, provided it remain transparent; yet when either of these circumstances is wanting, the sight is greatly vitiated. Thus, we see that in the yellow jaundice the adventitious colour wherewith the eye is tinged makes the patient think he sees many objects yellow which are of a contrary colour.

Motions of the eye are either external or internal. The external motion is that performed by its four straight and two oblique muscles, whereby the whole globe of the eye changes its situation or direction. The spherical figure of our eyes, and the loose connection to the edge of the orbit by the tunica conjunctiva, which is soft, flexible, and yielding, does excellently dispose them to be moved this or the other way, according to the situation of the object we would view. By the membranes the eye is connected to the edge of the orbit, which being soft and flexible, they do in such a manner as not in the least to impede its necessary motions; and that great quantity of fat placed all round the globe, betwixt it and the orbit, lubricates and softens the eye, and renders its motions more easy: hence arise the three following remarkable observations:

1. When nature has denied the head any motion, it is observable that she has, with great care and industry, provided for this defect. To this purpose belongs the surprising, beautiful and curious mechanism observable in the immoveable eyes of flies, wasps, &c. They nearly resemble two protuberant hemispheres, each consisting of a prodigious number of other little segments of a sphere, all which segments are perforated by a hole, which may be called their pupil, in which this is remarkable; that every foramen, or pupil, is of a lenticular nature, so that we see objects

through them topsy-turvy, as through so many convex glasses: they even become a small telescope, when there is a due focal distance between them and the lens of the microscope by which they are viewed. Leuwenhoek's observations make it probable that every lens of the cornea supplies the place of the crystalline humour, which seems to be wanting in those creatures; and that each has a distinct branch of the optic nerve answering to it, upon which the images are painted: so that as most animals are binocular, and spiders for the most part octonocular, so flies, &c. are multocular, having in effect as many eyes as there are perforations in the cornea, by which means (as other creatures with but two eyes are obliged, by the contraction of the muscles above-enumerated, to turn their eyes to objects) these have some or other of their pupils always ready placed towards objects nearly all around them: whence they are so far from being denied any benefit of this noble and most necessary sense of sight, that they have probably more of it than other creatures, answering to their necessities and ways of living.

2. As in man and most other creatures the eyes are situated in the head, because, among other reasons, it is the most convenient place for their defence and security, being composed of hard bones, wherein are formed two large strong sinuses, or sockets, commonly called orbits, for the convenient lodging of these tender organs, and securing them against external injuries; so in those creatures whose head, like their eyes and the rest of their body, is soft and without bones, nature has provided for this necessary and tender organ a wonderful kind of guard, by enduing the creature with a faculty of withdrawing his eyes into his head, and lodging them in the same safety within his body. We have a very beautiful example of this in snails, whose eyes are lodged in four horns, like atramentous spots, one at the end of each horn, which they can retract at pleasure when in any danger. Here it may be also observed, that the cornea in all animals that want eyelids, as fishes, exactly resembles in hardness the horn of a lanthorn; and therefore is not hurt by such particles as their eyes are commonly exposed to. And in the mole, because this animal lives under ground, it was necessary its eyes should be well guarded and defended against the many dangers and inconveniences to which its manner of living exposes it: this is the reason why its eyes are so small, and that they are situated so far in the head, and covered so strongly with hair; and besides, they can protrude and retract them at pleasure. The eyes of insects are more varied than in any other class of animals: for their form and distribution see ENTOMOLOGY, as also COMPARATIVE ANATOMY.

3. The third and last reflection we shall make upon the external motion of our eyes, is what regards a problem which has very much perplexed both physicians and philosophers, viz. What is the cause of the uniform motion of both eyes?

In some creatures, such as fishes, birds, and among quadrupeds the hare, cameleon, &c. the eyes are moved differently; the one towards one object, and the other towards another. But in man, sheep, oxen, and dogs, the motions are so uniform that they never fail to turn both towards the same place: hence in operations upon the eye that require it to be kept immoveable, sometimes it is necessary to tie up the sound eye with a compress, by which means the other is easier kept fixed and immoveable.

The final cause of this uniform motion is, 1. That the sight may be thence rendered more strong and perfect: for since each eye apart impresses the mind with an idea of the same object, the impression must be more strong and lively when both eyes concur; and that both may concur, it is necessary that they move uniformly; for though the retina, or immediate organ of vision, is expanded upon the whole bottom of the eye, as far as the ligamentum ciliare, yet nothing is clearly and distinctly seen but what the eye is directed to. 2. A second advantage we reap from the uniform motion of the eyes, which is more considerable than the former, consists in our being thereby enabled to judge with more certainty of the distance of objects.

There is yet another advantage, full as considerable as any of the former, that is thought to arise from the uniform motion of our eyes, and that is, the single appearance of objects seen with both our eyes; which, though at first view it does not appear probable, is true: for if in looking at an object you turn one of your eyes aside with your finger, and alter its direction, every thing will be seen double.

By the internal motions of the eye we understand those motions which only happen to some of its internal parts, such as the crystalline and iris; or to the whole eye when it changes its spherical figure, and becomes oblong or flat. The internal motions of our eyes are either such as respect the change of conformation that is necessary for seeing distinctly at different distances, or such as only respect the dilatation and contraction of the pupil.

That our eyes change their conformation, and accommodate themselves to the various distances of objects, will be evident to any person who but reflects on the manner and most obvious phænomena of vision. See VISION.

EYES OF HORSES. The state of the eyes in every horse constitute so much of his comparative value, that the greatest circumspection ought to be used in the examination previously to a purchase. The best and most experienced judges of horses err sometimes in a superficial survey. If, however, at first sight you are struck by the bright, bold, prominent appearance of the eyes, and observe they are sufficiently clear and transparent to reflect your own figure as you stand before them, and the horse neither winks, blinks, or rolls the orbs of his eyes about, as if feeling for the light within brought out of the stable, there is every well-founded reason to believe they are not only safe, but perfectly good. On the contrary, when the eye appears flat, as if sunk in its orbit, with a vacuum round the orb, between it and the eye-lid, it is a very unfavourable indication; particularly if there should be no defluxion or inflammatory discharge from the eye, to justify the idea of a temporary injury by a blow, bite, or some similar accident. If there be a palpable indentation above the orbs, and a wrinkled contraction of the eye-lids towards the forehead, there can be no doubt of great danger, and it would not be advisable to purchase. A small pig-eye should be likewise carefully avoided, as it is seldom to be depended upon. The horse possessing an eye of this kind is frequently addicted to starting, and the future state of the eye is in general doubtful. A cloudy muddiness within the outer humour of the eye, or a milky thickening of the surface, denotes present defect, and great probability of approaching danger.

Eye, in architecture, any round window made in a pediment, an attic, or the like. **Eye** *of a dome*, an aperture at the top of a dome **Eye** *of the volute*, the centre of its spiral.

Eye of a seed. See Hilum.

Eye (Bull's). In astronomy. See Aldebaran.

Eye, a borough in Suffolk, with a market on Saturdays. It has a manufacture of bone-lace, and sends two members to parliament. Lat 52. 20 N. Lon. 1. 10 E.

Eye-ball, the apple of the eye.

Eye-bright. See Euphrasia.

Eye-brow. A layer of short hair which lies thick upon the lower part of the frontal bone, on the superior prominent part of the orbit.

EY'ED. *a.* (from *eye.*) Having eyes (*Spenser*).

EY'EDROP. *s.* (*eye* and *drop.*) Tear (*Shakspeare*).

EY'EGLANCE. *s* (*eye* and *glance.*) Quick notice of the eye (*Spenser*).

EY'EGLASS. *s.* (*eye* and *glass.*) Spectacles; glass to assist the sight (*Shakspeare*).

EY'ELASH. *s.* (*eye* and *lash.*) The line of hair that edges the eyelid.

EY'ELESS. *a.* (from *eye.*) Without eyes; sightless; deprived of sight (*Milton*).

EY'ELET. *s.* (*œillet*, French.) A hole through which light may enter; any small perforation for a lace to go through (*Wiseman*).

EY'ELID. Palpebra. The semilunar moveable production of the skin which covers the eye when shut. It is distinguished into upper and under eye-lid.

EY'EMOUTH, a seaport, in Berwickshire. Lat. 55. 51 N. Lon. 1. 50 W.

EY'ESERVANT. *s* (*eye* and *servant.*) A servant that works only while watched.

EY'ESERVICE. *s.* (*eye* and *service.*) Service performed only under inspection (*Colossians*).

EY'ESHOT. *s.* (*eye* and *shot.*) Sight; glance; view (*Spectator*).

EY'ESIGHT. *s.* (*eye* and *sight.*) Sight of the eye (*Samuel*).

EY'ESORE. *s.* (*eye* and *sore.*) Something offensive to the sight (*Clarendon*).

EYESPO'TTED. *a.* (*eye* and *spot.*) Marked with spots like eyes (*Spenser*).

EY'ESTRING. *s.* (*eye* and *string.*) The tendon by which the eye is moved (*Shakspeare*).

EY'ETOOTH. *s.* (*eye* and *tooth.*) The tooth in the upper jaw next on each side to the grinders; the fang (*Ray*).

EY'EWINK. *s.* (*eye* and *wink.*) A wink, as a hint or token (*Shakspeare*).

EYEWI'TNESS. *s.* (*eye* and *witness.*) An ocular evidence; one who gives testimony to facts seen with his own eyes (*Addison*).

EYMOUTIERS, a town of France, in the department of Upper Vienne, containing about 2000 inhabitants; and having a considerable trade in skins, leather, and rags. Lat. 46. 10 N. Lon. 1. 10 E.

EYNDHOVEN, a town of Dutch Brabant, in the district of Bois-le-Duc. Lat. 51. 31 N. Lon. 5. 26 E.

EYRAC, or Irac, Arabia, a province of Turkey in Asia, 345 miles in length, and 190 in breadth, of which Bagdad is the capital.

EYRE or Eire, in law, the court of itinerant justices.

EYRIE, among falconers, the nest where hawks sit, and hatch, and feed their young. Hence, a young hawk newly taken from the nest is called an *eyess*.

EZEKIEL, in scripture history, was one of those Jews who were carried captive to Babylon, along with Jehoiakim (or Jeconiah), king of Judah. In the fifth year of this captivity, the æra from which he dates his prophecies, he began his office, which he exercised about 21 years. The commencement of this period falls on the year before Christ 595, and 34 years after Jeremiah had begun his office; so that the last eight years of Jeremiah coincide with the first eight of Ezekiel. The design of this prophet seems to be chiefly to convince his fellow captives in Babylon that they were mistaking in supposing that their brethren who still remained in Judea were in happier circumstances than they; and for this purpose, he describes the terrible judgments impending over that country; the final destruction of Jerusalem, both city and temple; and inveighs against those heinous sins which were the cause of such calamities.

More particularly, the first three chapters contain a glorious appearance of God to the prophet, who is commissioned to his office, with instructions and encouragements in the discharge of it. The prophet then (to chap. xxv.) treats of the sins and punishments of the Jews, especially of those left in Judea, by several apt visions and similitudes. From thence to chap. xxxiii, he foretels the destruction of several neighbouring nations, enemies to the Jews;

and from chap. xxxiii—xl. censures the sins, murmurings, and hypocrisy of the Jewish captives in Babylon; with which, however, he intersperses promises of their approaching deliverance, together with intimations of a still more glorious redemption in future times under the Messiah. The last nine chapters contain a remarkable vision of the structure of a new temple and a new polity for Israel and strangers; applicable in the first instance to the return from the Babylonian captivity, but in its ultimate sense, to the glory and prosperity of the universal church of Christ in future times.

The style of Ezekiel is generally very bold and majestic. It assumes much of that species of the sublime which approximates to the terrible. From the nature of his visions, however, more than from his language, he is often obscure, especially towards the beginning and end of his book. The freedom with which he reproved his countrymen for their idolatry is said to have cost him his life; the common fate of most of the prophets.

EZRA, son of Seraiah, the priest of the Jews, and a descendant of Aaron. He was carried into captivity to Babylon by Nebuchadnezzar; but Artaxerxes Longomanus sent him to his own country with a colony of the Jews, and all the sacred vessels and ornaments of the temple, which he had in charge to rebuild. On his arrival at Jerusalem 467 B.C. he set about the reformation of abuses, particularly that of strange marriages. He also brought the writings of Moses into the temple; and restored the whole canon of the Old Testament in the same order in which it now stands, only changing the ancient Hebrew writing to the modern character, which is the same with the Chaldee. There is in the Bible a book under his name, and in the Apocrypha two others, called in our received version, the First and Second Books of Esdras.

F.

F, the fourth consonant, and sixth letter of the alphabet. The letter F is borrowed from the digamma or double gamma of the Æolians, as is evident from the inscription on the pedestal of the colossus at Delos; and was probably formed from the old Hebrew vau: and though this letter is not found in the modern Greek alphabet, yet it was in the ancient one.

This letter is derived to us from the Romans, who borrowed it from the Æolians; among whom it is called digamma, or double gamma, as resembling two Γ's, one over the other: add, that the digamma seems in its origin to have been no other than the Greek Φ, which being made at three strokes, degenerated at length into the figure F. For the letter Φ being compounded of an omicron with a perpendicular drawn through it, if that perpendicular be made first, and the ο at two strokes afterwards, viz. first the upper, then the under part, it may happen, especially in writing fast, that the two parts shall not join; and even instead of two arches of circles, haste and conveniency may naturally enough make two straight lines.

What confirms this transmutation of the Φ into *F*, is, that on the medals of Philip, and the kings of Syria, in the words ΕΠΙΦΑΝΟΥΣ and ΦΙΛΑΔΕΛΦΟΥ, the phi is frequently seen in the form just mentioned; i. e. it has no circle or omicron; but across the middle of the perpendicular is a kind of right line, formed only of two dots, the one on the right side, and the other on the left, representing a cross †. Such appears to be the origin of the letter *F*, which of consequence is no other than a corruption of the Greek φ; and accordingly, on the medals of the Falisci the *F* is ordinarily put in lieu of the Greek φ: but it must be added, that though the Greek and Latin letter were thus the same thing, yet the sound was much softer among the Latins than among the Greeks, as was long ago observed by Terentianus.

The Romans for some time used an inverted F, Ⅎ, in lieu of a V consonant, which had no peculiar figure in their alphabet: thus, in inscriptions we meet with TERMINAℲIT, DIℲI, &c. According to Lipsius, in his Comment on the Annals of Tacitus, lib. xi. Covarruvias and Dausquius, this inverted digamma Ⅎ was first introduced by the emperor Claudius. See Tacit. An. lib. xi. cap. 4. and Suet. in Vit. Claud. cap. 41.

In the latter Roman writers we find the Latin *F* and Greek φ *ph* frequently confounded; as in *F*alanx for *Ph*alanx, *F*ilosophia for *Ph*ilosophia, which abuse is still retained by many French writers.

F is formed by compression of the whole lips, and a forcible breath. Though it has a name (*ef*) beginning with a vowel, it is numbered by grammarians among the semivowels; still it has this quality of a mute, that it is commodiously sounded before a liquid, as *flask*, *fly*, *freckle*. It has an unvariable sound, except that *of* is sometimes spoken nearly as *ov*.

F, or FA, in music, is the fourth note in rising in this order of the gamut, *ut*, *re*, *mi*, *fa*. It likewise denotes one of the Greek keys in music, destined for the bass.

F, in physical prescriptions stands for *fiat*, or "Let it be done." Thus *f. s. a.* signifies *fiat secundum artem*.

F was also a numeral letter, signifying 40; according to the verse, "Sexta quaterdenos gerit quæ distat ab alpha." And when a dash was added at top, thus F̄, it signified forty thousand.

F, in the civil law. Two f's joined together thus, *ff*, signify the pandects. See PANDECTS.

F, in criminal law, a stigma or brand put upon felons with a hot iron, on their being admitted to the benefit of clergy; by stat. 4 H. 7. c. 13.

FABA. (*faba.*) See BEAN, and VICIA.

FABA CRASSA. Telephium. Faba crassula. Anacampseros. The plant which bears these names in various pharmacopœias, is the orphine, *sedum telephium*; *foliis planiusculis serrates, corymbo foliose, caule erecto*, of Linnéus. It was formerly ranked as an antiphlogistic, but now forgotten.

FABA FEBRIFUGA. See FABA INDICA.

FABA INDI'CA. Faba sancti ignatii. Faba febrifuga. The seeds of a gourd-like fruit, the produce of the ignatia amara of Linnéus. They are of a roundish figure, very irregular and uneven, about the size of a middling nutmeg, semitransparent, and of a hard, horny texture. They have a very bitter taste, and no considerable smell. They are said to be used in the Philippine islands in all diseases, acting as a vomit and purgative. Infusions are given in the cure of intermittents, &c.

FABA PECHURIM. Faba pichurim. Faba pechuris. An oblong oval, brown, and ponderous seed, supposed to be the produce of a laurus, brought from the Brazils. The smell of these is like that of musk, between it and the scent of sassafras. They are exhibited as carminatives in flatulent colics, diarrhœas, and dysenteries.

Faba purgatrix. See Ricinus major.

Faba sancti ignatii. See Faba indica.

Faba suilla. See Hyosciamus.

FABA'CEOUS. *a.* (*fabaceus*, Lat.) Having the nature of a bean.

FABA'RIA. (*fabaria*, from *faba*, a bean, which it resembles.) Orphine. See Faba crassa.

FABARIÆ CALENDÆ, among the Romans, the calends of June.

FABATA'RIUM, in antiquity, a vessel to contain beans.

FABII. A noble and powerful family at Rome, who derived their name from *faba*, a bean, which their ancestors had cultivated.

FABIUS MAXIMUS RULLIANUS, who obtained the sirname of Maximus, for lessening the power of the populace at elections. He was master of horse, five times consul, twice dictator, and once censor. He triumphed over seven different nations in the neighbourhood of Rome, and rendered himself illustrious by his patriotism.—2. Q. Maximus, a celebrated Roman, who, from inactive childhood, was raised to the highest offices of the state. In his first consulship he obtained a victory over Liguria, and the fatal battle of Thrasymenus occasioned his election to the dictatorship. In this important office he began to oppose Annibal, not by fighting him in the open field, like his predecessors, but he continually harassed his army by countermarches and ambuscades, from which he received the sirname of Cunctator or delayer. Such operations, for the commander of the Roman armies, gave offence to some, and Fabius was even accused of cowardice. He, however, patiently bore to see his master of horse raised to share the dictatorial dignity with himself, by means of his enemies at home. Previously to the battle of Cannæ, he laid down his dictatorship, but shortly after obliged Tarentum to surrender to the Roman arms. He did not, however, live to see the success of the Roman arms, under Scipio. He died in the 100th year of his age, after he had been five times consul, and twice honoured with a triumph. *Liv. Polyb.* &c.—3. His son bore the same name, and showed himself worthy of his noble father's virtues.—4. Pictor, the first Roman historian who gave an historical account of his country. He flourished B. C. 225. The work now extant, which is attributed to him, is a spurious composition.

FABLE, a tale, or feigned narration, designed either to instruct or divert; or, as Mons. de la Motte defines it, an instruction disguised under the allegory of an action.

Fable seems to be the most ancient way of teaching: the principal difference between the eloquence of the ancients and that of the moderns consists, according to Pere Bossu, in this; that our manner of speaking is simple and proper, and theirs full of mysteries and allegorics: with them the truth was usually disguised under those ingenious inventions, called, by way of excellence, μυθοι, *fabulæ*, fables; that is, words, as intimating that there was the same difference between these fabulous discourses of the learned and the common language of the people, as between the words of men and the voices of beasts.

As to the laws of fable, the principal are, 1st. That to every fable there be some interpretation annexed to shew the moral sense or design thereof. This interpretation, if placed after the fable, is called επιμυθιον, or *affabulatio*; if before it, προμυθιον, *præfabulatio*. 2. That the narration be clear, probable, short, and pleasant. To preserve this probability the manners must be expressed and closely kept to, as in poetry.

M. de la Motte has some fine remarks on the subject of fables, at the beginning of his Fables Nouvelles, dediées au Roi, 1719. A fable, according to this polite writer, is a little epic poem, differing in nothing from the great one but in extent; and in that being less confined as to the choice of its persons, it may take in all sorts at pleasure, as gods, men, beasts, or genii; or even if occasion be, create persons; i. e. personify virtues, vices, rivers, trees, &c. Thus, M. de la Motte very happily introduces virtue, talent, and reputation as persons making a voyage together. See Epopoeia and Personifying.

That author suggests two reasons why fables have pleased in all ages and places. The first is, that self-love is spared in the instruction. The second, that the mind is exercised by the allegory. Men do not love direct precepts; too proud to condescend to those philosophers who seem to command what they teach, they require to be instructed in a more humble manner; they would never amend, if they thought that to amend were to obey: add, that there is a sort of activity in the mind which must be humoured; it pleases itself in a penetration which discovers more than is shewn; and in apprehending what is hid under a veil, fancies itself in some measure the author of it. The fable must always imply or convey some truth; in other works, delight alone may suffice; but the fable must instruct. Its essence is to be a symbol, and of consequence to signify somewhat more than is expressed by the latter. This truth should for the generality be a moral one; and a series of fictions conceived and composed in this view would form a treatise of morality preferable to any more direct and methodical treatise; accordingly Socrates, we are told, had a design to compose a course of morality in this way. This truth should be concealed under the allegory; and in strictness, it ought not to be explained either at the beginning or end.

The truth or idea intended should arise in the reader's mind from the fable itself. However, for the conveniency of the less discerning readers, it may be a good way to point out the truth or moral in preciser terms. To have the moral at the end of the fable seems much better than at the beginning: the mind is apt to be forestalled in the latter case; I carry the key along with me, so that there is no room to exercise my mind in finding any thing myself.

Jotham's beautiful fable of the trees is the oldest that is extant. Nathan's fable of the poor man and his lamb is the next in antiquity, and had so good an effect as to convey instruction to the ear of a king. We find Æsop in the most distant ages of Greece; and, in the early days of the Roman commonwealth, we find a mutiny appeased by a fable of the belly and the members. As fables had their rise in the very infancy of learning, they never flourished more than when learning was at its greatest height: witness Horace, Boileau, and Fontaine.

The English too have had some good fabulists, particularly Gay, and Moore.

Fable is also used for the plot of an epic or dramatic poem; and, according to Aristotle, it is the principal part and soul as it were of a poem. In this sense the fable is defined a discourse invented with art to inform the manners by instruction disguised under the allegory of an action. The contrivance of each fable must have two parts; namely, the intrigue and discovery. Every fable must have these two parts to be the subject of a just poem. Besides, the fable must, to be perfect, be admirable and probable; the admirable is that part of it which is contrary to the ordinary course of nature; the probable is whatever suits with the common opinion. But the most part of those that compose poems, by too great a passion to create admiration, take not sufficient care to temper it with probability. Almost all the ancient poets, however judicious in other respects, have been guilty of this fault: not to speak of the moderns. Probability gives credit to whatever is most fabulous in poetry; it serves also to give a greater lustre and air of perfection than even truth itself; for truth represents things only as they are, but probability renders them as they ought to be.

Fable, according to Mr. Pope, may be divided into the probable, the allegorical, and the marvellous. The probable fable is the recital of such actions as though they did not happen, yet might in the common course of nature: or of such, as though they did, become fables by the additional episodes and manner of telling them. Of this sort is the main story of an epic poem, the return of Ulysses, the settlement of the Trojans in Italy, or the like. That of the Iliad is the anger of Achilles, the most short and single subject that ever was chosen by any poet. Yet this has Homer supplied with a vaster variety of incidents and events, and crowded with a greater number of councils, speeches, battles, and episodes of all kinds, than are to be found even in those poems whose schemes are of the utmost latitude and irregularity. The action is hurried on with the most vehement spirit, and its whole duration employs not so much as fifty days. Virgil, for want of so warm a genius, aided himself by taking in a more extensive subject, as well as a greater length of time, and contracting the design of both Homer's poems into one, which is yet but a fourth part as large as his. The other epic poets have used the same practice, but generally so far as to superinduce a multiplicity of fables, destroy the unity of action, and lose their readers in an unreasonable length of time. Nor is it only in the main design that they have been unable to add to his invention, but they have followed him in every episode and part of story. If he has given a regular catalogue of an army, they all draw up their forces in the same order. If he has funeral games for Patroclus, Virgil has the same for Anchises; and Statius (rather than omit them) destroys the unity of his action for those of Archemoras. If Ulysses visits the shades, the Æneas of Virgil, and Scipio of Silius, are sent after him. If he be detained from his return by the allurements of Calypso, so is Æneas by Dido, and Rinaldo by Armida. If Achilles be absent from the army, on the score of a quarrel, through half the poem, Rinaldo must absent himself just as long, on the like account. If he gives his hero a suit of celestial armour, Virgil and Tasso make the same present to theirs.

To proceed to the allegorical fable: if we reflect upon those innumerable knowledges, those secrets of nature and physical philosophy which Homer is generally supposed to have wrapt up in his allegories, what a new and ample scene of wonder may this consideration afford us! How fertile will that imagination appear, which was able to clothe all the properties of elements, the qualifications of the mind, the virtues and vices, in forms and persons; and to introduce them into actions agreeable to the nature of the things they shadowed! This is a field in which no succeeding poets could dispute with Homer: and whatever commendations have been allowed them on this head, are by no means for their invention for having enlarged his circle, but for their judgment in having contracted it. For when the mode of learning changed in following ages, and science was delivered in a plainer manner; it then became as reasonable in the more modern poets to lay it aside, as it was in Homer to make use of it. And perhaps it was no unhappy circumstance for Virgil, that there was not in his time that demand upon him of so great an invention, as might be capable of furnishing all those allegorical parts of a poem.

The marvellous fable includes whatever is supernatural, and especially the machines of the gods. Homer seems the first who brought them into a system of machinery for poetry, and such a one as makes its greatest importance and dignity. For we find those authors who have been offended at the literal notion of the gods, constantly laying their accusation against Homer as the chief support of it. But whatever cause there might be to blame his machines in a philosophical or a religious view, they are so perfect in the poetic, that mankind have been ever since contented to follow them: none have been able to enlarge the sphere of poetry beyond the limits he has set: every attempt of this nature has proved unsuccessful; and after all the various changes of times and religions, his gods continue to this day the gods of poetry.

We have extracted most of the preceding remarks from Mr. Pope's preface to his Homer: they not only tend to illustrate the nature of fable in poetry, both as it means the design of a poem, and as it is taken for fiction; but they also shew that if this be truly called the "Soul of Poetry," it was first breathed into it by Homer.

To FA'BLE. *v. n.* (from the noun.) 1. To feign; to write not truth but fiction (*Prior*). 2. To tell falsehoods; to lie (*Shakspeare*).

To FA'BLE. *v. a.* To feign; to tell falsely (*Milton*).

FA'BLED. *a.* (from *fable.*) Celebrated in fables (*Tickel*).

FA'BLER. *s.* (from *fable.*) A dealer in fiction; a writer of feigned stories.

FABRIANO (Gentile da), an eminent historical painter, born at Verona in 1332, and died in 1412. The doge and senate of Venice, as a reward for his genius, conferred upon him the title of nobility.

FABRIANO, a town of Italy, in the marquisate of Ancona, famous for its excellent paper. Lat. 42. 10 N. Lon. 12. 32 E.

FA'BRIC. *s.* (*fabrica*, Latin.) 1. A building; an edifice (*Wotton*). 2. Any system or compages of matter (*Prior*).

To FA'BRIC. *v. a.* (from the noun.) To build; to form; to construct (*Philips*).

To FABRI'CATE. *v. a.* (*fabricor*, Latin. 1. To build; to construct. 2. To forge; to devise falsely.

FABRICA'TION. *s.* (from *fabricate.*) The act of building; construction (*Hale*).

FABRICIA. In botany, a genus of the class icosandria, order monogynia. Calyx five-cleft, half superior; petals five, without claws; stigma capitate; capsule many-celled; seeds winged. Two species; natives of New-Holland.

FABRICIUS (Caius), a famous Roman, who was twice consul, and gained several victories over the Samnites and Lucanians; but his integrity and contempt of riches have done more honour to his memory than his military renown. Being sent ambassador to Pyrrhus, he refused the presents which were offered him, and spurned with virtuous indignation the attempts made to corrupt his fidelity. But not content with proving faithful to his country, he excited Pyrrhus's gratitude as well as admiration, by discovering to him the perfidy of his physician, who had made an offer to the Romans of poisoning his royal master. This brave and virtuous man died in poverty about 250 B. C. and was buried at the public expence. The state also portioned out his two daughters in marriage. (*Watkins*).

FABRICIUS (George), a learned German, and famous for his Latin poetry, born in Upper Saxony in 1516. In 1550 he published Roma, containing a description of that city, and written on the spot. On his return to his own country he settled as a schoolmaster, and died in 1571. His poems were printed at Basle in 1567, in 2 vols. 8vo. He also wrote some books in prose, as the Annals of Massein, Origines Saxonicæ, &c.

FABRICIUS (Jerome), an Italian physician, usually called Aquapendente, from the place of his birth. He professed anatomy with great reputation at Padua for forty years, and the republic of Venice settled upon him a pension of 1000 golden crowns, besides which they honoured him with a statue and gold chain. He died about 1603. His works in surgery and anatomy have been printed in 2 vols. folio. (*Watkins*).

FABROT (Charles Hannibal), one of the most celebrated civilians of his time, was born at Aix in 1681: and acquired an extraordinary skill in the civil and canon law, and in the belles letters. He published the Basilicæ or Constitutions of the Emperors of the East, in Greek and Latin, with learned notes, in seven vols. folio; and editions of Cedrenus, Nicetas, Anastasius, Bibliothecarus, Constantine Manasses, and Cujas, with learned and curious notes.

FA'BULIST. *s.* (*fabuliste*, Fr.) A writer of fables (*Croxal*).

FABULO'SITY, *s.* (*fabulositas*, Latin.) Fulness of feigned stories (*Abbot*).

FA'BULOUS. *a.* (*fabulosus*, Lat.) Feigned; full of fables, or invented tales (*Addison*).

FA'BULOUSLY. *ad.* In fiction (*Brown*).

FACE. *s.* (*face*, Fr. from *facies*, Latin.) 1. The visage (*Bacon*). 2. Countenance; cast of the features (*Pope*). 3. The surface of any thing (*Genesis*). 4. The front or fore part of any thing (*Ezekiel*). 5. Visible state of affairs (*Milton*). 6. Appearance; resemblance (*Ben Jonson*). 7. Presence; sight (*Dryden*). 8. Confidence; boldness (*Tillotson*). 9. Distortion of the face (*Shakspeare*).

On some of these acceptations we must enlarge; as below.

FACE. The bones of the face are divided into those of the upper and under jaw. The upper jaw consists of thirteen bones, viz. two superior maxillary, two jugal, two nasal, two lachrymal, two inferior spongy, two palatine, and the vomer. The under jaw is formed of one bone, the inferior maxillary bone. The muscles of the face are those of the eyelids, eyeball, nose, mouth, and lips. See ANATOMY.

The human face is called the image of the soul, as being the seat of the principal organs of sense; and the place where the ideas, emotions, &c. of the soul are chiefly set to view. Pride and disdain are shown in the eye-brows, modesty on the cheeks, majesty in the forehead, &c. It is the face shews the sex, age, temperament, health, or disease, &c. The face, considered as the index of the passions, habits, &c. of the person, makes the subject of physiognomy See PHYSIOGNOMY.

FACE, among painters and artists, is used to denote a certain dimension of the human body, adopted for determining the proportion which the several parts should bear to one another: thus the different parts of the body are said to consist, in length, of so many faces. See Drawing.

Face, in the military art, a word of command, intimating to turn about: thus, *face to the right*, is to turn upon the left heel a quarter-round to the right; and, *face to the left*, is to turn upon the right heel a quarter-round to the left.

Face, or Façade, in architecture, is used for the front of a building, or the side on which the chief entrance is; also for the side it presents to a street, garden, court, &c. and sometimes for any side opposite to the eye.

Face, Facia, or Fascia, denotes a flat member having a considerable breadth, and but a small projecture, used in architraves and pedestals.

Face, in astrology, the third part of a sign.

Face *to* Face. (An adverbial expression.) 1. When both parties are present (*Acts*). 2. Without the interposition of other bodies; nakedly (*Corinthians*).

To Face. *v. n.* (from the noun.) 1. To carry a false appearance (*Spenser*). 2. To turn the face; to come in front (*Dryden*).

To Face. *v. a.* 1. To meet in front; to oppose with confidence and firmness (*Dryden*). 2. To oppose with impudence (*Hudibras*). 3. To stand opposite to (*Pope*). 4. To cover with an additional superficies (*Addison*).

FA'CELESS. *s.* (from *face.*) Being without a face.

FACEPAI'NTER. *s.* (*face* and *painter.*) A drawer of portraits.

FACEPAI'NTING. *s.* (*face* and *painting.*) The art of drawing portraits (*Dryden*).

FA'CET. *s.* (*facette*, Fr.) A small surface; a superficies cut into several angles (*Bacon*).

FACE'TIOUS. *a.* (*faceticux*, Fr.) Gay; cheerful; lively; witty (*Gov. of the Tongue*).

FACE'TIOUSLY. *ad.* (from *facetious.*) Gayly; cheerfully; wittily; merrily.

FACE'TIOUSNESS. *s.* (from *facetious.*) Cheerful wit; mirth; gayety.

FACIAL NERVE. Nervus facialis. Portio dura of the auditory nerve. These nerves are two in number, and are properly the eighth pair: but are commonly called the seventh, being reckoned with the auditory, which is the portio mollis of the seventh pair. They arise from the fourth ventricle of the brain, pass through the petrous portion of the temporal bone to the face, where they form the pes anserina, which supplies the integuments of the face and forehead.

FACIES. (*facies.*) See Face.

Facies hippocratica. That particular disposition of the features which immediately precedes the stroke of death is so called, because it has been so admirably described by Hippocrates.

FA'CILE. *a.* (*facile*, French.) 1. Easy; not difficult; performable or attainable with little labour (*Milton*). 2. Easily surmountable; easily conquerable. 3. Easy of access or converse; not haughty; not supercilious; not austere (*Ben Janson*). 4. Pliant; flexible; easily persuaded (*Calamy*).

To FACI'LITATE. *v. a.* (*faciliter*, Fr.) To make easy; to free from difficulty (*Clarendon*).

FACI'LITY. *s.* (*facilité*, French.) 1. Easiness to be performed; freedom from difficulty (*Raleigh*). 2. Readiness in performing; dexterity (*Dryden*). 3. Vitious ductility; easiness to be persuaded; ready compliance (*Bacon*). 4. Easiness of access; affability (*South*).

FACINE'RIOUS. *a.* Wicked; facinorous (*Shakspeare*).

FA'CING. *s.* (from *to face.*) An ornamental covering (*Wotton*).

FACI'NOROUS. *a.* (*facinora*, Latin.) Wicked; atrocious; detestably bad.

FACI'NOROUSNESS. *s.* (from *facinorous.*) Wickedness in a high degree.

FACIO (Bartholomew), a writer of the 15th century, born at Spezzia, in the territory of Genoa, and secretary to Alphonso king of Naples. He died about 1457. His works are, 1. De Bello Venetio Claudiano, seu inter Venetos et Gennenses, circiter anno 1391, 8vo. 1578. 2. De rebus ab Alphonso I. Rege Neapolitano gestis, lib. x. 3. De Humanæ Vitæ Felicitate, ad Alphonsum Neap. Reg. 4. De Viris illustr. sui Temporis.

FACT. *s.* (*factum*, Latin.) 1. A thing done; an effect produced (*South*). 2. Reality; not supposition (*Smalridge*). 3. Action; deed (*Dryden*).

FA'CTION. *s.* (*faction*, French.) 1. A party in a state (*Shakspeare*). 2. Tumult; discord; dissension (*Clarendon*).

Faction, in antiquity, a name given to the different companies of combatants in the circus. They were four, viz. the white, the red, the green, and the blue; to which Domitian added another of purple colour.

FA'CTIONARY. *s.* (*factionaire*, French.) A party man: not in use (*Shakspeare*).

FA'CTIOUS. *s.* (*factieux*, French.) 1. Given to faction; loud and violent in a party; publicly dissentious (*Shakspeare*). 2. Proceeding from public dissensions (*K. Charles*).

FA'CTIOUSLY. *ad.* In a manner criminally dissentious or tumultuous (*K. Charles*).

FA'CTIOUSNESS. *s.* (from *factious.*) Inclination to public dissension.

FACTI'TIOUS. *a.* (*factitius*, Lat.) Made by art, in opposition to what is made by nature (*Boyle*).

Factitious or artificial character. Character factitius. In natural history, a mark or marks distinguishing one genus from another in an artificial arrangement: such as is done by Ray and others in synoptical tables of vegetables.

FACTOR, in commerce, is an agent employed by merchants residing at other places, to buy or sell goods, or negotiate bills, or transact any kind of business on their account; and intitled to a certain allowance for his trouble. A supercargo differs from a factor in this: the business of the former is limited to the care of a particular cargo; he goes along with it, and generally returns when the business is completed: the latter has a fixed residence abroad, and executes business for different merchants. But their duties, and the circumstances for which they are accountable, are the same.

The duty of a factor is to procure the best intelligence of the state of trade at his place of residence; of the course of exchange; of the quantity and quality of goods at market, their present price, and the probability that it may rise or fall; to pay exact obedience to the orders of his employers; to consult their advantage in matters referred to his direction; to execute their business with all the dispatch that circumstances admit; to be early in his intelligence, distinct in his accounts, and punctual in his correspondence. As fidelity and diligence are required from the factor, so the law requires the like from the principal: if, therefore, a merchant remits counterfeit jewels to his factor, who sells them as true ones, and sustains loss or damage by imprisonment or other punishment, the principal shall not make satisfaction to the factor but to the party who purchased them. Business of this kind is called commission-business; and traders in this way have current as well as commission accounts constantly between them, and draw on, remit to, and send commissions to each other only by the intercourse of letters, which, among men of honour, are as obligatory and authoritative as all the bonds and ties of law.

In case of a factor's insolvency, the owner may reclaim his goods; and if they be sold on trust, the owner, and not the factor's creditors, shall recover payment of the debts.

Factors, in multiplication, a name given to the multiplier and multiplicand; so called because they constitute the product, or factum, as it is sometimes called.

FACTORAGE, called also commission, is the allowance given to factors by the merchant who employs them. A factor's commission in Britain, on most kinds of goods, is 2½ per cent.: on lead, and some other articles, 2 per cent.

FA'CTORY. *s.* (from *factum.*) 1. A house or district inhabited by traders in a distant country. 2. The traders embodied in one place.

FACTO'TUM. *s.* (*fac totum*, Latin.) A servant employed alike in all kinds of business.

FA'CTURE. *s.* (French.) The act or manner of making any thing.

FACULÆ, in astronomy, certain bright and shining parts, which the modern astronomers have, by means of telescopes, observed upon or about the surface of the sun: they are but seldom seen. The word is pure Latin; being a diminutive of *fax*, torch; and supposed to be here applied from their appearing and disappearing by turns. See Sun.

FA'CULTY. *s.* (*faculté*, Fr. *facultas*, Lat.) 1. The power of doing any thing; ability (*Hooker*). 2. Powers of the mind, imagination, reason, memory (*Swift*). 3. Mechanical power (*Wilkins*). 4. (In physic.) A power or ability to perform any action, natural, vital, and animal (*Quincy*). 5. A knack; habitual excellence; dexterity (*Clarendon*). 6. Quality personal; disposition or habit of good or ill (*Shakspeare*). 7. Natural virtue; efficacy (*Milton*). 8. Power; authority (*Shakspeare*). 9. Privilege; right to do any thing (*Hooker*).

Faculty, in law, a privilege granted to a person, by favour and indulgence, of doing what, by law, he ought not to do. For granting these privileges there is a court under the archbishop of Canterbury, called the court of the faculties, the chief officer of which is styled master of the faculties, who has a power of granting dispensations in divers cases: as to marry without the banns being first published; to ordain a deacon under age; for a son to succeed his father in his benefice; a clerk to hold two or more livings, &c.

Faculty, in the schools, a term applied to the different members of an university, divided according to the arts and sciences taught there: thus in most universities there are four faculties, viz. 1. Of arts, which include humanity and philosophy. 2. Of theology. 3. Of physic. And, 4. Of civil law. The degrees in the several faculties in our universities are those of bachelor, master, and doctor.

Faculty of advocates, a term applied to the college or society of advocates in Scotland, who plead in all actions before the court of session. They meet in the beginning of every year, and choose the annual officers of the society, viz. dean, treasurer, clerks, private and public examinators, and a curator of their library. The manner of admission into the faculty of advocates is by a trial of the civil law, and Scotch law: the person desiring to be admitted having, upon petition, obtained a recommendation to the dean of the faculty, he gives a remit to the private examinators, who are nine in number, and who, after their election, having divided the body of the civil law into nine parts, each taking one, appoint a diet for examination: in this diet there must be at least seven present, each of whom examines the candidate; and the question being afterwards put, Qualified, yea or no? they give their opinion by balloting, upon which the candidate is either admitted by signing his petition, or remitted to his studies. After the private trial the dean of the faculty assigns the candidate a title of the civil law, for the subject of a thesis; which being distributed among the advocates, the faculty meet on a day appointed, when three at least of fifteen public examinators dispute against the thesis; and afterwards the faculty give their opinions by balloting, as in the private trial. If the candidate is found qualified, the dean assigns him a law for an harangue before the lords; which harangue being made, he is admitted a member of the faculty, upon paying the fees, taking the oaths to the government, and an oath to be faithful in his office.

FACU'ND. *a.* (*facundus*, Lat.) Eloquent.

To FA'DDLE. *v. n.* To trifle; to toy; to play.

To FADE. *v. n.* (*fade*, French.) 1. To tend from greater to less vigour; to grow weak; to languish. 2. To tend from a brighter to a weaker colour (*Boyle*). 3. To wither, as a vegetable (*Isaiah*). 4. To die away gradually; to vanish (*Addison*). 5. To be naturally not durable; to be transient (*Locke*).

To FADE. *v. a.* To wear away; to reduce to languor, to deprive of vigour (*Dryden*).

To FADGE. *v. n.* (ȝeꝼeȝan, Saxon.) 1. To suit; to fit; to have one part consistent with another (*Shakspeare*). 2. To agree; to live in amity (*Hudibras*). 3. To succeed; to hit (*L'Estrange*).

FÆCES. (from *fæx, fæcis*, Latin. It is doubtful whether this word is derived from *facio*, or from *figo*: it is more generaly referred by grammarians to the former, who add that the diphthong *æ* is made use of to distinguish the dative case singular, which would otherwise be *feci*, from *feci* the verb in the preterperfect tense.) Feces. The excrementitious matter of the intestines.

The keen eye and assaying touch of the chemist, which have now ventured into every department, and material of nature, have not refrained from an examination of this repressive compound: and we shall give a few of the more general results which have been collected from the research.

The fæces not only vary in their consistence in different animals, but even in the same animal at different times, and this variety is found to pass through all the degrees, from a fluid state nearly to a firm solidity. The colour is equally variable: in man it is more or less yellow; in some quadrupeds, as the horse and cow, it is a dark green; in the pig it is greyish; in the dog it is sometimes white, at other times black; in some kinds it is white like chalk, as in those particularly that live by suction, viz. the woodcock and snipe; in some insects it is red, as the bug and flea, whilst in others it is green.

The odour also is various. It is generally more or less fetid, but in the cat it is extremely so, and more so in carnivorous animals than graminivorous animals; whilst in those of some animals there is scarcely any smell.

Since the fæces are the refuse of the food, by which animals are supported, it is natural, to suppose that these differences must arise from the nature and properties of the food the animal takes in; and this difference of food will equally have an influence on them when submitted to chemical analysis. With respect to their colour, it generally arises from a portion of bile they contain; and as to their fetid odour, Fourcroy is of opinion it arises from the commencement of putrefaction, which already takes place during their passage through the intestines, although some chemists will not allow of any such putrefaction.

Some of the old alchemists had an idea that the philosopher's stone was concealed in animal fæces, and on this account many experiments have been made, particularly upon the human, and those of quadrupeds; but from the great obscurity that is thrown over their writings nothing satisfactory is to be learned from them. The best chemist, according to Maequer, who has investigated the nature of human fæces, is Homberg; and this unpleasant operation he undertook for the satisfaction of a friend, who affirmed, that a white oil, of no unpleasant odour, was to be extracted from them, which possessed the valuable property of fixing quicksilver in such a manner as to be converted into silver. Homberg found the oil, but it had no such effect on quicksilver.

Fresh human fæces, distilled on a water bath, even to dryness, afforded nothing but an aqueous, clear, tasteless fluid, of a disagreeable smell; no volatile alkali, however, appeared, although it had approached to a putrid state, whilst putrid substances always afford it at the same heat. The dry residue, on increasing the heat by degrees, gave a volatile alkaline spirit and salt, a stinking oil and a carbonaceous portion remained, consequently the same substances as other animal matters.

The same sort of fæces lixiviated with water, filtered and evaporated, afforded an oily nitrated salt, which fused on red hot coals like saltpetre, and heated to a certain point in close vessels, inflamed. Putrid excrements gave an oil without colour or smell. To this it may be added, that the fæcal matter which Homberg analyzed was from a person who had been fed on coarse bread, and Champaigne wine. We learn from Haller, that the human fæces contain a small quantity of acid, which is found in great abundance in the ruminating class; and Brugnatelli speaks of an acid existing in the fæces of carnivorous birds; those of the dog, however, contain none of it. Those of ruminating animals, likewise, effervesce with the nitrous acid, which is produced in a much stronger degree with the fæces of the dog, hen, and pigeon. In some countries it is not uncommon to make use of pig's dung instead of soap.

The following is the result of a careful analysis of human fæces according to Berzelius.

Water	73·3
Vegetable and animal remains	7·0
Bile	0·9
Albumen	0·9
Peculiar extractive matter	2·7
Salts	1·2
Slimy matter, consisting of resin of bile, peculiar animal matter, and insoluble residue	14·0
	100·0

The excrementitious matter examined by Thaer and Einhof was that of cattle fed at the stall, chiefly on turnips. It had a yellowish green colour, a smell somewhat similar to that of musk, but little taste. Its specific gravity was 1·045. It did not alter vegetable blues, and of course contained no uncombined acid or alkali.

Sulphuric acid, when mixed with this matter, developes the odour of acetic acid; but Thaer and Einhof have shown that this acid does not exist in the fæces, but is formed by he action of the sulphuric acid. The pure alkalies, nitric and muriatic acids, produced little change on the fæces of cattle, at least when not assisted by heat.

When 100 parts are dried on a steam bath, hey leave 28¼ of solid matter.

When eight ounces, or 3840 grains, were diffused through water, they let fall a quantity of sand, weighing 45 grains.

The watery solution being strained through a linen cloth left 600 grains of a yellowish fibrous matter, which possessed the properties of the fibrous matter of plants.

The liquid, on standing, deposited a slimy substance, which was separated by filtration. It weighed when dry 480 grains. To this matter the fæces owe their peculiar colour and smell. It was insoluble in water and alcohol. When heated it smelled like bile. It burnt like vegetable matter. Alkalies scarcely affected it. Sulphuric acid developed the odour of acetic acid. Oxymuriatic acid rendered it yellow. Thaer and Einhof considered this substance as the remains of the vegetable matter employed as food by the cattle; but it is extremely probable that it might contain also a portion of the resin of bile, as Berzelius detected that substance in a similar matter from the human fæces.

The filtered solution passed through colourless, but on exposure to the air became in a few minutes wine yellow and then brown. When evaporated to dryness it left a brownish matter, of a bitterish taste, and weighing 90 grains. It was soluble in water, insoluble in alcohol, and precipitated from water by that liquid. It was not precipitated by infusion of galls. The solution was found to contain some phosphoric salts. The 90 grains of residue, when heated, burnt like animal matter. They soon ran into putrefaction, exhaling ammonia.

When evaporated to dryness and burnt, this excrementitious matter left behind it an ash, which was found (not reckoning the sand) to consist of the following salts and earths in the proportions stated.

Lime	12
Phosphat of lime	12·5
Magnesia	2
Iron	5
Alumina with some manganese	14
Silica	52
Muriat and sulphat of pot-ash	1·2

Thaer and Einhof made numerous experiments on the putrefaction of cow-dung, both in close vessels and in the open air, from which it would appear that the process resembles closely the putrefaction of vegetable matter; the oxygen of the air being abundantly changed into carbonic acid.

To Vauquelin we are indebted for an analysis of the fixed parts of the excrements of fowls, and a comparison of them with the fixed parts of the food; from which some very curious consequences may be deduced.

He found that a hen devoured in ten days 11111·843 grains troy of oats. These contained

136·509 grains phosphat of lime
219·548 silica

356·057

During these ten days she laid four eggs; the shells of which contained 98·776 grains phosphorat of lime, and 453·417 grains carbonat of lime. The excrements emitted during these ten days contained 175·529 grains phosphat of lime, 58·494 grains of carbonat of lime, and 185·266 grains of silica. Consequently the fixed parts thrown out of the system during these ten days amounted to

274·305 grains of phosphat of lime
511·911 carbonat of lime
185·266 silica

Given out 971·482
Taken in 356·057

Surplus 615·425

Consequently the quantity of fixed matter given out of the system in ten days exceeded the quantity taken in by 615·425 grains.

The silica taken in amounted to 219.548 grains
That given out was only 185·266 grains

Remains 34·282

Consequently there disappeared 34·282 grains of silica.

The phosphat of lime taken in was . . . 136·509 grains.
That given out was . 274·305 grains

137·796

Consequently there must have been formed, by digestion in this fowl, no less than 137·796 grains of phosphat of lime, besides 511·911 grains of carbonat. Consequently lime (and perhaps also phosphorus) is not a simple substance, but a compound, and formed of ingredients which exist in oat seed, water, or air, the only substances to which the fowl had access. Silica may enter into its composition, as a part of the silica had disappeared; but if so, it must be combined with a great quantity of some other substance.

These consequences are too important to be admitted without a very rigorous examination. The experiment must be repeated frequently, and we must be absolutely certain that the hen has no access to any calcareous earth, and that she has not diminished in weight; because in that case some of the calcareous earth of which part of her body is composed may have been employed. This rigour is the more necessary, as it seems pretty evident, from experiments made long ago, that some birds at least cannot produce eggs unless they have access to calcareous earth. Dr. Fordyce found, that if the canary bird was not supplied with lime at the time of her laying, she frequently died, from her eggs not coming forward properly. He divided a number of these birds at the time of their laying eggs into two parties: to the one he gave a piece of old mortar, which the little animals swallowed greedily; they laid their eggs as usual, and all of them lived; whereas many of the other party, which were supplied with no lime died. Vauquelin also ascertained, according to Fourcroy, that pigeons dung contains an acid of a peculiar nature, which increases when the matter is diluted with water; but gradually gives place to ammonia, which is at least exhaled in abundance.

The white matter voided by dogs who feed chiefly on bones, was formerly used in medicine under the name of album græcum. It has not been examined by modern chemists; but is supposed to consist in a great measure of the earthy part of the bones used as food.

FÆCULA. (often spelt *fecula*, but without authority from any ancient MSS. though *fetus* from *feo* is perhaps more correct than *fœtus*; and *feces* and *fæces* are used indiscriminately as doubtful whether derived from *facio* or *figo*.) In chemistry, a term generally applied to any fine pulverulent matter extracted from whatever part of a vegetable, simply by breaking down its texture, washing with water, and subsidence for a greater or less time. The fæcula is the substance deposited at the bottom of the water. It is therefore in other words a most minutely divided substance, capable of being for a time suspended but not dissolved in cold water or in the native vegetable juices. Of these the most important is the amylaceous fæcula, or a nutritive insipid substance which is contained most abundantly in all grains forming the largest and most valuable part of their substance, and when separated, purified, and dried, is the common starch. The preparation of STARCH as a manufacture will be described under that article, the chemical properties of pure fæcula belong to the present subject.

Almost every part of vegetables will furnish this fæcula, but it is particularly found in all grains or seeds of whatever kind, is united in them with an extractive and saccharine matter, sometimes with gluten and vegetable albumen, with mucilage or with oil. It is also contained copiously though comparatively in less proportion in most roots, particularly the tuberous and bulbous, in the medullary part of trees and plants, and sometimes nearly equally diffused over the whole plant, as in many of the lichens and plants of a similar genus.

The extraction of the fæcula is a very simple process, but from certain vegetables it can never be obtained free from colour and taste. The root or grain employed must first be thoroughly bruised, rasped, or broken down in any way, and then washed with a quantity of cold water, which becomes immediately turbid, and if the fæcula is white, milky; and simply holds the fæcula suspended in a state of extreme division, but without dissolving any portion of it. This turbid water is then to be immediately separated from the fibrous pulp by a sieve, and allowed to remain at rest for a time, when the fecula will be found at the bottom, in the form of a very fine close-grained powder, but without any tenacity or cohesion, somewhat of the consistence of very fine wetted sand. It should then be washed repeatedly with abundance of water, till this comes from it quite insipid.

The extraction of fæcula is therefore as simple as possible, consisting in fact only of a single operation, that of washing out with cold water; but it is only from grains and some roots that it can be procured so easily, for this simple method will not succeed in the nut or kernel seeds, in which the mixture of oil, fæcula, and mucilage is so intimate, that both dissolve together into a milky emulsion when agitated with water; nor will mere washing easily separate the fæcula from many of the juices, fruits, and soft parts in which it is intimately combined with mucilage, extract, and saline substances.

In all processes for the separation of fæcula from other vegetable matters, it should be constantly kept in mind that only cold water is to be employed, for when hot it dissolves readily.

Pure fæcula (taking starch for an example) is a white powder nearly if not absolutely insipid, somewhat adhering to the tongue, but readily softening down in the mouth into an incohering pulp. When examined with care in a strong light, and especially with the help of a lens, it is seen to be composed of small semi-transparent globules, with a sattiny gloss and somewhat of a crystalline arrangement. When in mass and squeezed between the fingers, it breaks with a slight snap and a peculiar short feel not easily described. It is not easily moistened with cold water, on the surface of which it swims till thoroughly wetted.

Pure starch, when heated strongly in the open air, passes from yellow to red and brown, softens, puffs up, exhales a white, pungent, acid smelling smoke, exactly resembling that of mucilage or sugar, and leaves a spongy and rather bulky coal. The products of its distillation are, a water loaded with pyromucous acid, some drops of red or brown oil, much carbonic acid and hydrocarbonous gasses. The coal when fully calcined leaves slight traces of potash and phosphat of lime.

Starch does not easily alter in the air, but by very long keeping it runs into clots, and gets a sour and rancid smell.

Fæcula rubbed with a little cold water only makes an incoherent mass, which on drying cracks into small pieces. With more water and a moderate warmth the mixture ferments faintly, and turns sour, probably by producing the acetous acid.

Boiling water, however, acts in a very different manner on fæcula, for it speedily and totally dissolves it into a thick, tenacious, transparent jelly, as is daily seen in the domestic uses of starch. This jelly becomes thicker and more tenacious by long boiling, and it will unite with boiling water in any proportion. By slow evaporation the jelly shrinks in every direction, and at last dries into a nearly transparent brittle substance, so closely resembling the evaporated solution of mucilage, that scarcely any difference can be found between the two.

The jelly when much diluted and dried on very extended surfaces gives only a kind of varnish and stiffness, for which it is of great use in the starching of linen.

Most of the acids dissolve fæcula readily, especially when hot, and with nearly the same appearances that attend their action on mucilage and sugar. The nitric acid, however, does not produce with fæcula the mucous acid, as it does with gum mucilage.

The alkalies dissolve fæcula with ease, but without appearing to produce any material change in its composition.

On the whole, the resemblance between the amylaceous fæcula and mucilage is so strong, that they may almost be considered as identical when each is brought to a state of solution in water.

Of the green Fæcula of Plants.

A vast number of the green succulent plants when exposed to slight pressure give a very turbid green juice, from which a fecula subsides though extremely slow, but it may be separated more readily by the filter. In this case the filtered liquor is tenacious, but clear and colourless, and a green pulp is left on the filter. Rouelle appears to have been the first who clearly showed the nature of this fæcula, and proved it to be not in the least similar to the amylaceous fæcula, but to be composed of a substance resembling the gluten of wheat, intimately combined with a kind of resin soluble in alcohol, to which the green colour seems to be owing. The clear liquor from which this fæcula has subsided also holds in solution another portion of gluten, or a similar matter.

Fourcroy considers this fæcula rather as albuminous, and the substance contained in the clear liquor to be still more decidedly so; but Proust has pointed out some differences, and the other observations of this excellent chemist on this subject are also important.

When any of the green turbid juice of plants, such as of cabbage, hemlock, cress, and the like, is exposed to heat, it coagulates or becomes ropy, and soon a considerable quantity of a green, tough, glutinous mass separates in flocculi from the liquor, which is then left colourless. The clear filtered recent juice of plants also affords flocculi of gluten, which readily separate at a heat as low as 145°; at this temperature the albumen of an egg mixed with water will not coagulate. When the coagulated mass dries, it hardens into an elastic horny substance which will not again unite with water. If this fæcula, either before or after coagulation by heat, be kept under water, in warm weather it becomes offensive in a day's time, and by keeping it grows excessively putrid, with the fetor attending animal matter in a high state of decomposition. It appears to be to this that the excessive putrescency of hemp is owing whilst it is retting in ditches to prepare it for spinning. The water in which this fæcula has been long kept contains sulphuretted hydrogen, carbonat of ammonia, and some gluten dissolved in the ammonia.

The green fæcula when put into potash partly dissolves therein, the insoluble portion falling to the bottom as a green sediment. The solution has all the characters of animal matters, exhaling ammonia, and blackening silver and many other metallic solutions.

When the entire green fæculous precipitate, formed by heating the recent juice, is treated by alcohol, a portion only dissolves therein, leaving the true gluten untouched, and which amounts to about 80 per cent. of the entire precipitate. The alcoholic solution evaporated to dryness leaves (as Rouelle first observed) a soft green substance resembling a resin. Alcohol also added to the juices gives a precipitate of gluten, and unites with the resin. It has been doubted, however, by Parmentier whether this green resin is properly so called, since it does not deposit any thing on mixture with water, as the tinctures of the true resins do. The oxymuriatic acid in a few days takes away all colour from this green resin, makes it ropy like turpentine, and its solution in alcohol will then grow turbid with water. The entire green fecula is reduced by oxymuriatic acid to the colour of dead leaves. The above resin gives a clear solution with potash, and this colour will attach itself to silk, but it is not permanent. On the whole, therefore, there is much reason to believe that the green fæcula of plants consists of gluten intimately combined with a substance very nearly resembling a resin, and that it is to the former principle that the tendency to animal putrefaction and the ammoniacal products are owing, and in the latter the green colour seems entirely to reside.

FAENZA (the ancient *Faventia*), a town of Romagna, in Italy, with a bishop's see. It is famous for fine earthen ware. Lat. 44. 21 N. Lon. 11. 40 E.

FAERNUS (Gabriel), a Latin poet and writer of the 16th century. He wrote some Latin elegies, and fables in the same language in iambic verse. Bentley has given his notes upon Terence entire, in his edition of that author. He died at Rome in 1561.

FÆX. (*fæx, fæcis, fæces.*) The alvine excretions. See FÆCES.

To FAG. *v. a.* (*fatigo*, Latin.) To grow weary; to faint with weariness (*Mackenzie*).

FAGARA. Iron-wood. In botany, a genus of the class tetrandria, order monogynia. Calyx four-cleft; corol four-petalled; capsule two-valved, one-seeded. Twelve species; chiefly natives of the East Indies and South America, shrubby or arboreous. The chief is f. octandra with pinnate leaves, downy each side; the leaflets ovate, toothed; common petiole wing-jointed, flowers eight—male. A tall tree, abounding in a balsamic glutinous juice, racemed flowers, with white calyxes and yellow corols. Its balsam resembles the gum tacamahae, but is not the same; this last being the production of the calophyllum.

FAGE (Raymond de la), an ingenious French artist, who acquired, by his own application, a great skill in drawing with the pen or Indian ink. He generally used to draw in a public house, and paid his reckonings with a sketch. He died in 1690, aged 42.

FAGIUS (Paul), *alias* Buchlin, a learned Protestant minister, born at Rheinzabern in Germany, in 1504. He was a schoolmaster at Isna; but afterwards became a zealous preacher, and wrote many books. The persecution in Germany menacing danger to all who did not profess the Romish doctrines, he and Bucer came over to England in 1549, at the invitation of archbishop Cranmer, to perfect a new translation of the scriptures. Fagius took the Old Testament, and Bucer the New, for their respective parts; but the design was at that time frustrated by the sudden death of both. Fagius died in 1550, and Bucer did not live above a year after. Their bodies were dug up and burned in the reign of queen Mary.

FAGNANO (Count Julius-Charles de), marquis of Toschi and St. Honorio, was one of the most distinguished Italian mathematicians. We have not been able to collect any authentic particulars relative to his life and person. It is conjectured that he was born about 1690. He attained considerable eminence among the Italian geometers about 1719: for at that period, he gave in the Italian journals some very interesting memoirs on geometrical problems and the transcendental analysis. Several curious papers of his, on elliptic arcs, &c. are given in the Leipsic Acts. His works were collected and published by himself under the title Produzzioni mathematiche, del Conte Giulis-Carlo di Fagnano, &c. Pesaro, 1750, 2 vols. 4to. The various objects of these cannot here be detailed. In the first volume there is a general theory of geometrical proportions: in the second a treatise on the properties of plane triangles, containing much very curious matter: among the other pieces in the second volume, are many which relate to the properties and uses of the curve called the lemniscate; a figure of which is engraven on the frontispiece of the book. Here also we find Fagnano's curious theorem from whence may be deduced a new measure of the arcs of the ellipse, hyperbola, and conoid, first published in the Diarium Eruditorium Italiæ, tom. 26. an. 1716; a theorem which furnished part of the topics of dispute between the late Mr. John Landen, and Dr. Henry Clarke. (See Clarke's Supplement to Lorgna on Series, p. 54, &c.) We have not learned the exact period of count Fagnano's death.

Fagnano (John Francis de Tuschis de), archdeacon of Sinigaglia, the son of the above, was an able mathematician who trod in the steps of his father. He has several interesting memoirs in the Leipsic Acts, for 1754, 1762, 1774, 1775, and 1776. Our attempts to obtain any biographical information have here also been equally unsuccessful.

FAGON (Guy Crescent), chief physician to Louis XIV. born at Paris in 1632. He was an early champion for the doctrine of the circulation of the blood, and was a laborious collector of plants to enrich the royal garden, of which he was appointed superintendant. By his recommendation Tournefort was sent to the East for plants. Fagon died in 1718.

FAGONIA, in botany, a genus of the class decandria, order monogynia. Calyx five-leaved; petals five; capsule five-celled, ten-valved; the cells one-seeded. Four species: three natives of the east; and one of Spain: all herbaceous plants.

FAGOPYRUM, or Buck-wheat. See Polygonum.

FA'GOT. *s.* (*fagod*, Welsh; *fagot*, Fr.) 1. A bundle of sticks bound together for the fire (*Fairfax*). 2. A bundle of sticks for any purpose (*Addison*). 3. A soldier numbered in the muster roll, but not really existing.

To Fa'got. *v. a.* (from the noun.) To tie up; to bundle together (*Dryden*).

FAGOTTO. See Bassoon.

FAGRÆA, in botany, a genus of the class pentandria, order monogynia. Corol funnel-form, with a very long tube; stigma peltate; berry two-celled, fleshy; seeds globular. One species only; a shrub of Ceylon, with thick square branches, and large terminal flowers.

FAGUS, in botany, a genus of the class monoecia, order hexandria. Male; calyx campanulate, five-cleft; corolless; stamens from five to twelve. Fem.; calyx four-cleft; corolless; styles two or three-cleft; seeds two or three, covered with a coriaceous, prickly calyx. Five species.

1. F. castanea. Chesnut-tree. Leaves lanceolate, with pointed serratures, naked underneath; prickles of the fruit compound and entangled together. Indigenous to our own woods.

2. F. pumila. Dwarf chesnut, or chinguapine. Leaves lance-ovate, acutely serrate, downy underneath; aments filiform, knotty. A native of North America.

3. F. sylvatica. Beech-tree. Leaves ovate, obscurely serrate; spines of the fruit simple. Common to our own woods.

4. F. ferruginea. Leaves ovate-oblong, remotely and acutely serrate, pointed, downy underneath. North America.

5. F. cochinchinensis. Leaves ovate, crowded; fruit three-celled, three-valved. A native of Cochinchina.

The beech-tree is a native of Europe, and may be propagated by seeds, or from suckers, but the first way is the most eligible. The season for sowing the seeds is any time from October to February. When the plants come up, they must be constantly kept clean from weeds, and if thick together, the strongest of them must be drawn out in the autumn following, that those left may have room to grow; by which means a seed bed may afford a three year's draught of young plants, which should be planted in a nursery, and at three feet distance, if designed for timber-trees, row from row, and eighteen inches in the rows. But, if designed for hedges, to which the tree is well adapted, the distance need not be so great; two feet, row from row, and one foot in the rows, will be sufficient. In this nursery they may remain two or three years, observing to clear them from weeds; as also to dig up the ground between the roots at least once a year, taking care not to bruise the roots, nor to dig the ground in summer, when the earth is hot, and dry. When this tree is propagated from suckers, it should be planted at once where it is designed to stand. It will grow to a considerable height, and thrives least in a chalky or stony ground.

The common chesnut-tree is more frequently a native of Italy, and the southern parts of Europe; and is propagated by planting the nuts in February in beds of fresh undunged earth. The best nuts for sowing are those brought from Portugal and Spain. This tree, however, ripens its fruit very well in our own country, which is as good for sowing, when the trees are designed either for timber or beauty, as the foreign nuts. They may be raised either in nurseries, or in the places where they are to stand. If in a nursery, the spot should be chosen upon poor ground, and trenches should be opened about the middle of February, four inches deep, and six inches asunder. In these the chesnuts should be planted regularly, one every four inches, with the eye uppermost; and the earth be drawn over them. Half a dozen of these trenches should be made, and then a space left by way of an alley, to get between in order to clean them; then another bed, of six rows, thus proceeding till a sufficient quantity be planted. Traps must be laid about the ground for vermin. The plants will appear in two months, and should then be kept clear from weeds, and suffered to stand two years: at the end of this time they should be taken up, and planted at two feet distance, in rows, a yard asunder; the long tap-root is to be cut off, and care taken not to injure the others. The best time for removing them is early in March; when the side shoots must be carefully trimmed off, that they may grow upright and straight. When they have stood four years in this place, they may be removed to the spots where they are designed to be stationary.

The chesnut grows to an enormous size, and is remarkable for its longevity. The largest in the known world grow on the sides of mount Etna: but in our own country at Tortworth, in Gloucestershire, is a tree that measures fifty-two feet in its circumference, is proved to have stood where it now is ever since the year 1150, fixes the boundary of the manor, and is probably near a thousand years old. As an ornament, the chesnut has great beauty, though it yields in elegance to the beech and in dignity to the oak. As a timber, it is often employed as a substitute for oak; and where no great dependence is to be placed on its strength it answers extremely well. It is chiefly valuable, however, as staves for liquor casks, and as underwood for hop poles. Its fruit is relished by many animals, and may be employed as a substitute for flour.

The beech is a tree, of pre-eminent value, whether regarded as an ornament in our forests and pleasure grounds, or as a useful timber after it is felled. It makes the stateliest and most magnificent single tree produced in this country; exhibiting a rotundity and elegance which almost may vie with the rude majesty of the oak: its branches are regular; its foliage soft; and its bark smooth and silvery. The chief objection to its use in architecture is that it is peculiarly subject to the worm: but the cabinet-maker and turner employ it more than any other timber: and it is to them what the oak is to the ship-builder, or the ash to the wheelwright. Its natural soil and situation is a dry, limy height, in which it will grow to a prodigious size and extent of ramification. The seeds yield a good lamp oil, and are eagerly eaten by squirrels, mice, and swine; the oil they contain is expressed in Silesia, and used by the poor people instead of butter.

FAHLUN, a town of Sweden, capital of Dalecarlia, situate in the midst of rocks and hills, between the lakes of Run and Warpen. It contains two churches, and (including the miners) 7000 inhabitants. The copper mine, which gives existence and celebrity to the town, is on its east side. Lat. 60. 34 N. Lon. 16. 42 E.

FAHRENHEIT (Gabriel Daniel), an ingenious experimental philosopher, born at Dantzic in 1686. About 1726 he improved the thermometer, by making use of mercury instead of spirits of wine, and forming a new scale for the instrument, grounded upon the most accurate experiments. The English have generally adopted this scale, while the French prefer Reaumur's, or recently, the centigrade thermometer. Fahrenheit wrote a dissertation on thermometers, and died in 1736.

To FAIL. *v. n.* (*fuiller*, French.) 1. To be deficient; to cease from former plenty; to fall short (*Locke*) 2. To be extinct; to cease; to be no longer produced (*Psalms*). 3. To cease; to perish; to be lost (*Addison*). 4. To die; to lose life (*Shakspeare*). 5. To sink; to be borne down (*Isaiah*). 6. To decay; to decline; to languish (*Milton*). 7. To miss; not to produce its effect (*Bacon*). 8. To miss; not to succeed in a design (*Shakspeare*). 9. To be deficient in duty (*Wake*).

To FAIL. *v. a.* 1. To desert; not to continue to assist or supply; to disappoint (*Locke*). 2. Not to assist; to neglect (*Davies*). 3. To omit; not to perform (*Dryden*). 4. To be wanting to (*Kings*).

FAIL. *s.* (from the verb.) 1. Miscarriage; miss; unsuccessfulness. 2. Omission; non-performance (*Shaksp.*). 3. Deficience; want. 4. Death; extinction (*Shakspeare*).

FAI'LING. *s.* (from *fail.*) Deficiency; imperfection; lapse (*Rogers*).

FAI'LURE. *s.* (from *fail.*) 1. Deficience; cessation (*Woodward*). 2. Omission; non-performance; slip (*South*). 3. A lapse; a slight fault.

FAIN. *a.* (ꝼeaᵹn, Saxon.) 1. Glad; merry; cheerful; fond (*Spenser*). 2. Forced; obliged; compelled (*Hooker*).

FAIN. *ad.* Gladly; very desirously (*Swift*).

To FAIN. *v. n.* To wish; to desire fondly (*Spenser*).

To FAINT. *v. n.* (*faner*, French.) 1. To decay; to wear or waste away quickly. 2. To lose the animal functions; to sink motionless and senseless (*Guardian*). 3. To grow feeble (*Bacon*). 4. To sink into dejection (*Milton*).

To **Faint.** *v. a.* To deject; to depress; to enfeeble (*Shakspeare*).

Faint. *a.* (*fane*, French.) 1. Languid; weak; feeble (*Temple*). 2. Not bright; not vivid; not striking (*Newton*). 3. Not loud; not piercing (*Boyle*). 4. Feeble of body (*Rambler*). 5. Cowardly; timorous (*Camden*). 6. Dejected; depressed (*Hebrews*). 7. Not vigorous; not active (*Davies*).

Faint-action, in aw, a feigned action, or such as, although the words of the writ are true, yet, for certain causes, the plaintiff has no title to recover by.

Faint-pleader, in law, a covinous, false, or collusory manner of pleading, to the deceit of a third person.

FAINTHEA'RTED. *a.* (*faint* and *heart*.) Cowardly; timorous (*Isaiah*).

FAINTHEA'RTEDLY. *ad.* Timorously.

FAINTHEA'RTEDNESS. *s.* Cowardice; timorousness; want of courage.

FA'INTING. *s.* (from *faint*.) Deliquium; temporary loss of animal motion. See Syncope.

FA'INTISHNESS. *s.* (from *faint*.) Weakness in a slight degree; incipient debility (*Arbuthnot*).

FA'INTLING. *a.* (from *faint*.) Timorous; feebleminded (*Arbuthnot*).

FA'INTLY. *ad.* (from *faint*.) 1. Feebly; languidly (*Walsh*). 2. Not in bright colours (*Pope*). 3. Without force of representation (*Shakspeare*). 4. Without strength of body (*Dryden*). 5. Not vigorously; not actively (*Shakspeare*). 6. Timorously; with dejection (*Denham*).

FA'INTNESS. *s.* (from *faint*.) 1. Languor; feebleness; want of strength. 2. Inactivity; want of vigour (*Spenser*). 3. Timorousness; dejection (*Shakspeare*).

FA'INTY. *a.* (from *faint*.) Weak; feeble; languid; debilitated (*Dryden*).

FAIR. *a.* (ꝼæᵹeꞃ, Saxon.) 1. Beautiful; elegant of feature; handsome (*Shakspeare*). 2. Not black; not brown; white in the complexion (*Hale*). 3. Pleasing to the eye (*Shakspeare*). 4. Clear; pure (*Boyle*). 5. Not cloudy; not foul; not tempestuous (*Shaksp.*). 6. Favourable; prosperous (*Prior*). 7. Likely to succeed (*Shakspeare*). 8. Equal; just (*Clarendon*). 9. Not effected by any insidious or unlawful methods; not foul (*Temple*). 10. Not practising any fraudulent or insidious arts (*Pope*). 11. Open; direct (*Dryden*). 12. Gentle; mild; not compulsory (*Spenser*). 13. Mild; not severe (*Milton*). 14. Pleasing; civil (*Shakspeare*). 15. Equitable; not injurious (*Milton*). 16. Commodious; easy (*Shak.*). 17. Liberal; not narrow (*Carew*).

Fair. *ad.* (from the adjective.) 1. Gently; decently; without violence (*Locke*). 2. Civilly; complaisantly (*Dryden*). 3. Happily; successfully (*Shakspeare*). 4. On good terms (*Collier*).

Fair. *s.* 1. A beauty; elliptically a fair woman (*Dryden*). 2. Honesty; just dealing (*Arbuthnot*).

Fair, a greater kind of market, granted to a town, by privilege, for the more speedy and commodious providing of such things as the place stands in need of. The word *fair* is formed from the French *foire*, which signifies the same thing; and *foire* is by some derived from the Latin *forum*, market; by others from the Latin *feriæ*, because anciently fairs were always held in those places where the wakes, or feasts of the dedications of churches, called *feriæ*, were held. It is incident to a fair, that persons should be free from being arrested in it for any other debt or contract than what was contracted in the same; or, at least, promised to be paid there. These fairs are generally kept once or twice a year; and, by statute, they shall not be held longer than they ought, by the lords thereof, on pain of their being seized into the king's hands, &c. Also, proclamation is to be made, how long they are to continue; and no person shall sell any goods after the time of the fair is ended, on forfeit of double the value, one fourth to the prosecutor and the rest to the king. There is a toll usually paid in fairs on the sale of goods, and for stallage, picage, &c.

Fairs abroad are either free, or charged with toll and impost. The privileges of free fairs consist chiefly, first, in that all traders, &c. whether natives or foreigners, are allowed to enter the kingdom, and are under the royal protection, exempt from duties, impositions, tolls, &c. Secondly, that merchants, in going or returning, cannot be molested or arrested, or their goods stopped. They are established by letters-patent from the prince. Fairs, particularly free fairs, make a very considerable article in the commerce of Europe, especially that of the Mediterranean, and inland parts of Germany, &c.

The principal British fairs, are, 1. Sturbridge fair, near Cambridge, formerly the largest in Britain; but lately it has somewhat declined. 2. Bristol has two fairs, very near as great as that of Sturbridge. 3. Exeter. 4. West Chester. 5. Edinburgh. 6. Wheyhill; and, 7. Burford fair; both for sheep. 8. Pancras fair, in Staffordshire, for saddle-horses. 9. Bartholomew-fair, at London, for lean and Welsh black cattle. 10 St. Faith's, in Norfolk, for Scotch runts. 11. Yarmouth and Lowestoft fishing-fairs for herrings, the only fishing-fairs in Great Britain. 12. Ipswich butter-fair. 13. Woodborough-hill, in Dorsetshire, for West country manufactures, as kerseys, druggets, &c., 14. Two cheese fairs at Chipping Norton: with innumerable other fairs, besides weekly markets, for all sorts of goods, as well our own as of foreign growth.

The principal fairs abroad are at Frankfort, Leipsic, Novi, Riga, Archangel, St. Germain, Lyons, Beaucaire, &c.

Fair-maid-of-Kent, in botany. See Ranunculus.

FAIRBURN WATER. A sulphureous water in the county of Ross, in North Britain.

FAIRFAX (Edward), an English poet. He was the son of sir Thomas Fairfax, of Denton, in Yorkshire, and discovered, when young, a lively taste for poetry: he translated Tasso's poem of Godfrey of Bullogn into English verse, which was greatly admired by king James and Charles I. He died about 1632, at his seat in Yorkshire.

FAIRFORD, a town of Gloucestershire, with a market on Thursday. The church was built for the sake of the glass, taken in a ship going to Rome. It has 28 large windows, curiously painted with scripture histories, in extremely beautiful colours; and designed by the famous Albert Durer. Lat. 51. 40 N. Lon. 1. 44 W.

FAIRING. *s.* A present given at, or brought from, a fair.

FAIR ISLE, an island of the Northern ocean, between Shetland and Orkney, from both which its high towering rocks are visible.

FA'IRLY. *ad.* (from *fair.*) 1. Beautifully. 2. Commodiously; conveniently (*Dryden*). 3. Honestly; justly; without shift (*Bacon*). 4. Ingenuously; plainly; openly (*Pope*). 5. Candidly; without sinistrous interpretations (*Dryden*). 6. Without violence to right reason (*Dryden*). 7. Without blots (*Shakspeare*). 8. Completely; without any deficience (*Spen.*).

FA'IRNESS. *s.* (from *fair.*) 1. Beauty; elegance of form (*Sidney*). 2. Honesty: candour; ingenuity (*Atterbury*).

FA'IRSPOKEN. *a.* (from *fair* and *speak.*) Bland and civil in language and address (*Hooker*).

FAIRY. (Neither Johnson nor any of his predecessors has been able to trace the origin of this term: like the term *genii*, which has also been supposed to be derived from the Latin, it is pure genuine Saracenic; and exists literally both in the Arabic and Persian, nearly in the same sense in which we use it.) In oriental traditions and romances, a sort of deity, or imaginary genius, conversant on the earth, and distinguished by a variety of fantastical actions either good or bad. Among ourselves they are most usually represented as females of an order superior to human nature, yet subject to wants, passions, accidents, and even death; sprightly and benevolent while young and handsome; morose, peevish, and malignant, if ugly, or in the decline of their beauty; fond of appearing in white, whence, by credulous people, they were often called the white ladies.

Fairy circle, or ring, a phænomenon pretty frequent in the fields, &c. supposed by the vulgar to be traced by the fairies in their dances. There are two kinds of it; one of about seven yards in diameter, containing a round bare path, a foot broad, with green grass in the middle of it. The other is of different extent, encompassed with a circumference of grass. Messrs. Jessop and Walker, in the Philosophical Transactions, ascribe them to lightning; and Mr. Nicholson, in his Journal (vol. i. p. 546.) has related some circumstances observed by himself after a thunder-storm, which show that in some instances these fairy rings are really produced by explosions of lightning. Still, however, it is admitted as incontrovertible, that in many cases the rings are caused by the running of a fungus.

Mr. Gough, Mr. Florian-Jolly, and Dr. Wollaston, have recently written upon this subject. But it is, nevertheless, still shrouded in some obscurity.

Fairy. *a.* 1. Given by fairies. 2. Belonging to fairies (*Shakspeare*).

FA'IRYSTONE. *s.* A stone found in gravel-pits.

FAISANS, an island in the river Bidassoa, which separates France from Spain. It is also called the Island of Conference, because Lewis XIV. and Philip IV. here swore to observe the peace of the Pyrenées, in 1660, after 24 conferences between their ministers. Here also the hostages of France and Spain are received and delivered, it being considered as a neutral place. It is situate between Andaye and Fontarabia. Lat. 43. 20 N. Lon. 1. 46 W.

FAISTENBERGER (Anthony), a painter of Inspruck, born in 1678, and died in 1722. His landscapes are pleasing, and the buildings are designed in the Roman taste. The scenes are generally solemn, though enlivened by cascades, rivers, and rocks; the trees are natural, their foliage touched with spirit, and the colouring is real nature. He had a younger brother called Joseph, whose manner so resembles that of Anthony as hardly to be distinguished from it.

FAITH. *s.* (*foi*, French.) 1. Belief of the revealed truths of religion (*Hooker. Hammond*). 2. The system of revealed truths held by the christian church (*Acts*). 3. Trust in God (*Swift*). 4. Tenet held (*Shakspeare*). 5. Trust in the honesty or veracity of another. 6. Fidelity; unshaken adherence (*Milton*). 7. Honour; social confidence (*Dryden*). 8. Sincerity; honesty; veracity (*Shakspeare*). 9. Promise given (*Shakspeare*).

Faith, Fides, in antiquity, as denoting honesty or fidelity, was deified by the Romans, and represented with an erect open air, and dressed in a thin robe, so fine that one might see through it. This deity is also represented as very old and grey-headed; and she appears on medals as giving her hand, and sometimes only by two hands joined together.

Faith, in philosophy and theology, that assent which we give to a proposition advanced by another, the truth of which we do not immediately perceive from our own reason or experience; or it is a judgment, or assent of the mind, the motive whereof is not any intrinsic evidence, but the authority, or testimony, of some other who reveals or relates it.

Hence, as there are two kinds of authorities and testimonies, the one of God, and the other of man, faith becomes distinguished into divine and human.

Faith (Divine), is that founded on the authority of God; or it is that assent we give to what is revealed by God.

The objects of this faith, therefore, are matters of revelation.

Faith (Human), is that whereby we believe what is told us by men.

The object hereof is matter of human testimony and evidence.

Faith, in practical theology, makes the first of the theological virtues or graces.

Faith in God, in this sense, denotes such a conviction of his being, perfections, character, and government, as produces love, trust, worship, obedience, and resignation. Faith in Christ, as it has been defined by some, is a mere assent to the gospel as true; according to others, it signifies such a persuasion that he is the Messiah, and such a desire and expectation of the blessings which he has promised in his gospel to his sincere disciples, as engage the mind to fix its dependence upon him, and subject itself to him in all the ways of holy obedience; and thus defined it is a very extensive principle, and includes in its nature and inseparable effects the whole of moral virtue. In this sense it has been said, that under the gospel a man is justified by faith. Faith, likewise, in respect to futurity, is a moral principle, implying such a conviction of the reality and importance of a future state as is sufficient to regulate the temper and conduct.

FAI'THBREACH. *s.* (*faith* and *breach.*) Breach of fidelity; disloyalty; perfidy (*Shakspeare*).

FAI'THED. *a.* (from *faith.*) Honest; sincere: not in use (*Shakspeare*).

FAI'THFUL. *a.* (*faith* and *full.*) 1. Firm in adherence to the truth of religion (*Ephesians*). 2. Of true fidelity; loyal; true to the allegiance or duty professed (*Milton*). 3. Honest; upright; without fraud (*Numbers*). 4. Observant of compact or promise (*Dryden*).

FAI'THFULLY. *ad.* 1. With firm belief in religion. 2. With full confidence in God. 3. With strict adherence to duty (*Shakspeare*). 4. Without failure of performance (*Dryden*). 5. Sincerely; with strong promises (*Bacon*). 6. Honestly; without fraud (*South*). 7. Confidently; steadily (*Shakspeare*).

FAI'THFULNESS. *s.* (from *faithful.*) 1. Honesty; veracity (*Psalms*). 2. Adherence to duty; loyalty (*Dryden*).

FAI'THLESNESS. *s.* (from *faithless.*) 1. Treachery; perfidy. 2. Unbelief as to revealed religion.

FA'ITHLESS. *a.* (from *faith.*) 1. Without belief in the revealed truths of religion; unconverted (*Hooker*). 2. Perfidious; disloyal; not true to duty (*Shakspeare*).

FAITHORNE (William), an English painter and engraver. He was a soldier in the royal army during the civil wars, and was taken prisoner by Cromwell. On obtaining his liberty he went to France, where he studied under Champaigne. After his return to England he practised both painting in miniature and engraving, but chiefly the latter. He also published a book in drawing, graving, and etching. He died in 1691, aged about 75. His son, William Faithorne, was a good engraver in mezzotinto.

FA'ITOUR. *s.* (*faitard,* Fr.) A scoundrel; a rascal; a mean fellow: obsolete (*Spen.*).

FAKE. *s* A coil of rope (*Harris*).

FAKENHAM, a town in Norfolk, with a market on Thursdays. Lat. 52. 53 N. Lon. 0. 58 E.

FAKIRS, Indian monks or friars. They out-do the severity and mortification of the ancient anchorets or solitaries. Some of them make a vow of continuing all their lifetime in one posture, and keep it effectually. Others never lie down; but continue in a standing posture all their lives, supported only by a stick, or rope under their arm-pits. Some mangle their bodies with scourges and knives. They look upon themselves to have conquered every passion, and triumphed over the world; and accordingly scruple not, as if in a state of innocence, to appear entirely naked in public. The common people of East India are thoroughly persuaded of the virtue and innocence of the fakirs; notwithstanding which they are accused of committing the most enormous crimes in private.

It is more than probable, these Indian friars have some secret art to lull their senses asleep, in order to render themselves in a great measure insensible of the excessive torments they voluntarily undergo. Ovington assures us that, "as he was one day in an assembly of fakirs, he observed that they drank opiates infused in water; the intoxicating virtue whereof was enough to turn their brain."

The garment of the chief fakirs consists of three or four yards of orange-coloured linen, which they tie round them, and a tiger's skin, which hangs over their shoulders. The hair is woven in tresses, and forms a kind of turban. The superior of the fakirs is distinguished from the rest by having a greater number of pieces in his garment, and by a chain of iron, two yards long, tied to his leg. When he designs to rest in any place, a garment is spread upon the ground; on which he sits and gives audience, whilst his disciples publish his virtues. Some persons of quality in India have become fakirs: among others, five great lords belonging to the court of Cha-gehan, mogul of the Indies. It is said, there are about two millions of fakirs in the East Indies.

FALAISE, a town of France, in the department of Calvados, with a castle, and one of the finest towers in France. It is remarkable for being the birth-place of William the Conqueror. It has a good trade in serges, linen, and lace. Lat. 48. 53 N. Lon. 0. 2 W.

FALCA'DE. *s.* (from *falx, falcis,* Latin.) A horse is said to make *falcades,* when he throws himself upon his haunches two or three times as in very quick curvets (*Farrier's Dict.*).

FA'LCATED. *a.* (*falcatus,* Lat.) Hooked; bent like a reaping hook (*Harris*).

FALCA'TION. *s.* Crookedness; form like that of a reaper's hook (*Brown*).

FALCIFORM PROCESS. (*falciformis;* from *falx,* a scythe, and *forma,* resemblance.) The falx. A process of the dura mater, that arises from the grista galli, separates the hemis spheres of the brain, and terminates in the tentorum.

FA'LCHION. *s.* (*faulchion, fauchon,* Fr.) A short, crooked, sword, or scymetar.

FALCO, in zoology, a genus of the class aves, order accipitres. Bill hooked, the base covered with a cere; head covered with close-set feathers; tongue bifid.

These, for the most part, are a rapacious tribe, and feed on putrid carcases; yet seldom, and never but when pressed by extreme hunger, attack living animals; they are bold, and fly with great speed when high in the air, but slowly in its lower regions; have an exquisite sense of smell, and are very quick-sighted: not gregarious; generally build in clefts of impending rocks their nests, which are called eyries, a term, however, which merely implies a place of eggs; but a few of them make their nests on the ground: the bill more hooked than in the vulture tribe; nostrils small, oval, placed in the cere; legs and feet scaly; middle and outer toes connected. A hundred and thirty-six species, including the tribes of eagle, falcon, and osprey; some birds improperly termed vultures, kite, hawk, buzzard, ring-tail, merlin, and hobby, scattered over the four continents of the globe; of which twenty-four are found in the interior or on the coasts of our own country. See Nat. Hist. pl. xcv. xcviii. c. cvi. and cxvi.

1. F. ossifragus. Osprey. Cere and legs yellow, the latter somewhat downy; body ferruginous; tail-feathers white on the inner side. Inhabits Europe and North America; size of a turkey; lives chiefly on fishes, upon which it darts down with surprising speed and dexterity when they are near the surface; but is incapable of diving after them. Its muscular strength in the act of flying is very great; the fish it generally darts upon is salmon; yet it has occasionally brought up a seal in its talons: and a curious print is exhibited by Barlow (which he took from having been an eye-witness of the fact itself) of an osprey soaring with a cat in the air, who resisted the capture with great spirit, in consequence of which both animals fell much injured to the ground, and were taken up by the designer himself, and are engraved in the 36th plate of his collection.

2. F. leucocephalus. Bald eagle. Cere and legs yellow; legs somewhat downy; body brown; head and tail white. Inhabits the woods of Europe and America: three feet three inches long; feeds on hogs, lambs, and fishes, which it takes from other birds; nest large; lays two eggs.

3. F. chrysaëtos. Golden eagle. Cere yellow; legs downy, yellowish-rusty; body variegated, brown and rusty; tail black, waved at the base with cinereous. Inhabits Europe and Siberia; flies to a vast height in serene weather, and descends against a storm; three feet long; legs feathered down to the toes; tail white beneath, black at the tip. The general weight is about twelve pounds. There are two instances in Scotland of this bird having flown away with infants to its nest: yet in both the theft was discovered time enough to extricate them without essential damage. Very long-lived, many instances occurring of its existing upwards of a century; whence probably the allusion of the psalmist, "thy youth is renewed like the eagle's." Being capable of enduring abstinence; instances having occurred of its continuing for upwards of twenty days without food of any kind.

4. F. fulcus. Ring-tailed eagle. Cere yellow; legs downy, rusty; back brown; tail with a white band. Another variety, with a white tail with a brown tip. Inhabits Europe, Asia, and America: builds on lofty rocks; is trained by the Tartars to hunt hares, antelopes, and foxes: its quill-feathers are used to mount arrows.

5. F. serpentarius. Secretary vulture. Body black; hind-head crested; tail-feathers white at the tips, the two middle ones longest; legs very long. Inhabits interior Africa, and the Philippine islands; three feet high; feeds on smaller animals.

6. F. harpyja. Crested eagle. Head crested with long feathers; body beneath variegated. Inhabits South America; size of a sheep; is said to be able to cleave a man's skull at a stroke; erects the crest in the form of a coronet.

7. F. barbatus. Bearded eagle. Whitish-fiery red; back brown; a black stripe above and beneath the eyes. Two other varieties from difference or different disposition of colours. Inhabits the Alps; the two last varieties the mountains of Persia: four feet long; builds in holes of inaccessible rocks; preys on alpine quadrupeds; and will attack men when asleep: flies in flocks.

8. F. Gallicus. French eagle. Bill cinereous; legs naked, yellowish; body grey-brown; beneath (in the male) whitish, with reddish brown spots. Inhabits France; two feet long; feeds on rats, mice, and frogs; builds its nest mostly on the ground; lays three grey eggs.

9. F. milvus. Kite. Cere yellow; tail forked; body ferruginous; head whitish.

β. Another variety; crown and throat chesnut.

γ. Cere greenish; body brownish; head, throat, and chin chesnut.

δ. Coverts of the back violet; feathers tipt with a white spot.

Inhabits Europe, Asia, and Africa: about two feet long; feeds on offal and poultry; flies placidly, and foretels storms by its clamour; eggs three, roundish, whitish, with dirty yellow spots; migrates into Europe the beginning of April.

10. F. Austriacus. Austrian kite. Cere and legs yellow; legs somewhat downy; body above chesnut, beneath brickdust colour spotted with brown: tail forked. Inhabits the woods of Austria; size of f. milvus; feeds on birds and bats.

11. F. haliaetos. Bald buzzard. Cere and feet blue; body brown above, white beneath; head white.

β. Another variety. Cere cinereous, legs pale; body above grey, beneath whitish; tail equal.

- γ. Tail brown, colour of the body, crown black, or brown variegated with white; belly white.
- δ. Body rusty brown; a white line from the upper mandible through the region of the eyes to the hind head, which is also white. Inhabits Europe, America, and Siberia, in marshy places, building among the reeds; nearly two feet long; feeds on ducks and fishes, which it catches by diving for.

12. F. antillarum. Mansfenny. Body brown; belly white; crown black. Inhabits the West Indian islands; eighteen inches long; feeds on birds and reptiles; legs and claws very large and strong.

13. F. orientalis. Oriental hawk. Legs lead colour; above the eyes a ferruginous streak; head and body above dusky brown, beneath rusty brown; tail spotted with white. Inhabits Japan: seventeen inches long.

14. F. butes. Buzzard. Cere and legs yellow; body brown; belly pale with brown spots. Inhabits our own country and Europe at large; twenty inches long; feeds on birds, insects, and smaller animals; varies in its colours.

15. F. æruginosus. Moor buzzard. Cere greenish; body grey; crown, chin, arm-pits, and legs yellow. Inhabits England and Europe generally; twenty-one inches long; builds its nest in marshy places; lives on fishes, aquatic birds and rabbits; varies in colour.

16. F. palumbarius. Goshawk. Cere black, edged with yellow; legs yellow; body brown; tail-feathers with pale bands; eyebrows white. Inhabits England and Europe generally, as also North America; twenty-two inches long; devours poultry; and was formerly much used in falconry.

17. F. communis. Common falcon. Yearly falcon. Aged falcon. Body brown, the feathers edged with rusty; tail with darker transverse bands; bill blueish-ash; cere, irids, and legs yellow.

- β. Another variety: inclining to brown.
- γ. Back gibbous.
- δ. Head, neck, and breast with brown spots.
- ε. Entirely white; with scarcely visible yellow spots.
- ζ. Uniformly brownish black.
- η. Wings spotted.
- θ. Body above brown with darker spots; beneath white with brown spots.
- ι. Spotted with black and red.
- κ. Body beneath reddish tawny.
- λ. Breast yellow with rusty spots; wings towards the tips spotted with white. Inhabits Europe and North America: the varieties marked ι. China; η. Hudson's bay; κ India. Larger than the goshawk; feeds on partridges. Bill dusky or lead colour; body beneath white, with dusky, heart-shaped spots; tail dotted with white; claws black.

18. F. gyrfalco. Brown gyrfalcon. Cere blue; legs yellow; body brown, with cinereous bands beneath; sides of the tail white. Inhabits Europe; preys on herons, cranes, and pigeons.

19. F. lannarius. Lanner. Cere yellow; legs and bill blue; body beneath with black longitudinal spots. Two other varieties, differing in shade or disposition of colour, but not essentially. Inhabits England, Sweden, Tartary, and other parts of Europe; size of a buzzard; migrates; builds its nest in low trees; and is much esteemed in falconry.

20. F. cyaneas. Hen-harrier. Cere white; legs tawny; body hoary-blue; a white arch over the eyes surrounding the chin. Inhabits England, other parts of Europe, and Africa: seventeen inches long.

21. F. tinnunculus. Restril. Cere and legs yellow; back purplish-red, with black spots; breast with brown streaks; tail rounded. Two other varieties from difference or different dispositions of colour. Inhabits England, Siberia, and other parts of Europe, on the tops of old buildings; migrates into the north early in the spring, preys on mice, small birds and insects; and was formerly trained for catching game.

22. F. nisus. Sparrow-hawk. Cere green; legs yellow; belly white waved with grey; tail with blackish bands. Two other varieties.

- β. Back spotted with white.
- γ. Body entirely white. Inhabits England and Europe generally, Africa, and Madeira; the male twelve inches long, the female fifteen; very bold; preys on poultry, partridges, pigeons, and small birds; and is taught to catch larks.

23. F. vespertinus. Ingrian falcon. Cere, legs, and eye-lids yellow; vent and thighs rusty. Inhabits Ingria, Russia, and Siberia; builds on the top branches of trees, or takes possession of the magpie's nest; preys on quails, and goes abroad chiefly in the evening and at night; size of a pigeon.

24. F. subbuteo. Hobby. Cere and legs yellow: back brown; nape white; belly palish with oblong brown spots. Another variety from slight difference of colour. Inhabits England, Siberia, and other parts of Europe: twelve inches long; preys on larks, which are so terrified by their appearance as to fly to mankind for protection.

25. F. æsolon. Merlin. Cere and legs yellow; head ferruginous; body above blueish-ash, with rusty spots and stripes; beneath yellowish-white with oblong spots. Inhabits Europe: twelve inches long; and migrates southerly on the approach of winter. Is seen not uncommonly in our own country. There are three other varieties with a trivial variance of colour; inhabiting the West India islands, or New York: about nine inches long.

26. F. pumilius. Tiny falcon. Legs yellow; body brown-ash, beneath whitish with blackish bars; crown whitish. Inhabits Cayenne: the smallest of the entire genus being hardly six inches long.

The common or yearly falcon is the bird most usually employed in ancient times in the sport or science of falconry He is superior to all others for courage, docility, gentleness, and nobleness of nature. Several authors take the name *falcon* to have been occasioned by its crooked talons or pounces, which resemble a falx or sickle. Giraldus derives it *a falcando,* because it flies in a curve. The falcon or falcon gentle, is both for the fist and for the lure. In the choice, take one that has wide nostrils, high and large eye-lids, a large black eye; a round head, somewhat full on the top; barb feathers on the clap of the beaks, which should be short, thick, and of an azure colour; the breast large, round, and fleshy; and the thighs, legs, and feet, large and strong; with the sear of the foot soft and blueish: the pounces should be black, with wings long and crossing the train, which should be short and very pliable. The name falcon is confined to the female: for the male is much smaller, weaker, and less courageous than the female; and therefore is denominated *tassel,* or *tircelet.* The falcon is excellent at the river, brook, and even field; and flies chiefly at the larger game, as wild-goose, kite, crow, heron, crane, pye, shoveler, &c. The custom of carrying a falcon about, extended to many countries, and was esteemed a distinction of a man of rank. The Welsh had a saying, that you may know a gentleman by his hawk, horse, and greyhound. In fact, a person of rank seldom went without one on his hand. Harold, afterwards king of England, is painted going upon a most important embassy, with a hawk on his hand and a dog under his arm. Henry VI. is represented at his nuptials attended by a nobleman and his falcon. Even the ladies were not without them in earlier times; for in an ancient sculpture in the church of Milton Abbas, in Dorsetshire, appears the consort of king Athelstan with a falcon on her royal fist tearing a bird.

FALCONER, a person who brings up, tames, and manages birds of prey; as falcons, hawks, &c. (See FALCONRY.) The grand seignor usually keeps 6000 falconers in his service. The French king had a grand falconer, which was an office dismembered from that of great hunt, *grand venur.* Historians take notice of this post as early as the year 1250.

FALCONER (William), a Scotch poet, who published, about 1762, an ingenious poem, called the Shipwreck. He also wrote an ode to the duke of York, which procured him the patronage of that prince. Falconer was a sailor, and compiled a very useful work, entitled, The Marine Dictionary. He went out in 1769 in the Aurora frigate, which was never heard of after sailing from the Cape of Good Hope for the East Indies.

FALCONET. See FAUCONET.

FALCONRY, or FAUCONRY, the art of taming, managing, and tutoring, birds of prey, particularly falcons and hawks; and employing them with advantage in the pursuit of game; called also hawking.

Professor Beckmann shews that so early as the time of Ctesias, hares and foxes were hunted in India by means of rapacious birds. The account of Aristotle, however, is still more to the purpose, and more worthy of notice. "In Thrace (says he) the men go out to catch birds with hawks. The men beat the reeds and bushes which grow in marshy places, in order to raise the small birds, which the hawks pursue and drive to the ground, where the fowlers kill them with poles." The same account is to be found in another book ascribed also to Aristotle; and which appears, at any rate, to be the work of an author not much younger. Respecting Thrace, which is situated above Amphipolis, a wonderful thing is told, which might appear incredible to those who had never heard it before. It is said that boys go out into the fields, and pursue birds by the assistance of hawks. When they have found a place convenient for their purpose, they call the hawks by their names, which immediately appear as soon as they hear their voices, and chase the birds into the bushes, where the boys knock them down with sticks and seize them. What is still more wonderful, when these hawks lay hold of any birds themselves, they throw them to the fowlers; but the boys, in return, give them some share of the prey. *De mirabilibus auscultat.* cap. 128.

Other writers after Aristotle, such as Antigonus, Ælian, Pliny, and Phile, have also given an account of this method of fowling. Ælian, who seldom relates any thing without some alteration or addition, says, that in Thrace nets were used, into which the birds were driven by the hawks; and in this he is followed by the poet Phile. Ælian, also, in another place describes a manner of hunting with hawks in India, which, as we are told by several travellers, is still practised in Persia, where it is well understood, and by other eastern nations.

"The Indians (says he) hunt hares and foxes in the following manner: they do not employ dogs, but eagles, crows, and, above all, kites, which they catch when young, and train for that purpose. They let loose a tame hare or fox, with a piece of flesh fastened to it, and suffer these birds to fly after it, in order to seize the flesh, which they are fond of, and which, on their return, they receive as the reward of their labour. When thus instructed to pursue their prey, they are sent after wild foxes and hares in the mountains; these they follow in hopes of obtaining their usual food, and soon catch them and bring them back to their masters, as we are informed by Ctesias. Instead of the flesh, however, which was fastened to the tame animals, they receive as food the entrails of the wild ones which they have caught."

It seems, therefore, that the Greeks received from India and Thrace the first information respecting the method of fowling with birds of prey; but it does not appear that this practice was introduced among them at a very early period. In Italy, however, it must have been very common, for Martial and Apuleius speak of it as a thing every where known; the former calls a hawk the fowler's servant.

Falconry, however, was practised with far more spirit and universality among the ancient Britons than among any other nation whatever. It commenced at least as early as the middle of the fifth century, and was cultivated as late as to the fifteenth or sixteenth, and seems at length to have fallen a sacrifice to the introduction of gunpowder and the field-sports to which gunpowder gave rise. In its zenith of estimation and practice a degree of consequence and dignity was attached to the art of falconry, which may well excite our surprise at the present moment. From the household regulations of Howel Dha, prince of Wales, in 942, we learn that the grand falconer ranked fourth in the order of precedency among the twenty-four chief officers of the Welsh court; and was limited to three draughts of strong potation or metheglin at the royal table, lest from intoxication he should neglect his hawks. When this exalted courtier succeeded in his sport, the prince rose to meet him and sometimes held his stirrup. At an early period of English history a similar degree of distinction appears to have been conferred on the same amusement by the English court. The office of grand falconer of England is still hereditary in the duke of St. Alban's family, as that of master of the game is in the duke of Grafton's. No hawks, however, are now kept; but the salary attached to the office continues, and amounts to 982*l.* 10*s.* per annum; independently of an additional sum of 30*l.* for each lunar month, making together 1372*l.* 10*s.* There are various deductions upon this gross amount: so that the net produce is reduced to about a thousand pounds sterling per annum.

FA'LDAGE. *s.* (*faldagium*, barbarous Lat.) A privilege of setting up folds for sheep in any field within the manor (*Harris*).

FA'LDING. *s.* A kind of coarse cloth.

FA'LDSTOOL. *s.* (*fald* or *fold* and *stool.*) A kind of stool placed at the south side of the altar, at which the kings of England kneel at their coronation.

FALDWORTH, among our old writers, a person of sufficient age to be reckoned of some decennary.

FALERII, in ancient geography, a town of Etruria, on the west or right side of the Tiber: the people of the town and territory were called Falisci. They made an excellent kind of sausage, called by Martial *Venter Faliscus*.

FALEZIN, a town of European Turkey, remarkable for a battle between the Turks and Russians, and for being the place where peace was concluded between those powers, in 1711. Lat. 45. 30 N. Lon. 27. 0 E.

FALKENBERG, a strong town of Upper Saxony, in Germany. Lat. 53. 35 N. Lon. 15. 58 E.

FALKENBURG, a maritime town of Sweden, seventeen miles N.W. of Helmstadt. Lat. 56. 52 N. Lon. 12. 50 E.

FA'LKIA, in botany, a genus of the class hexandria, order digynia. Calyx one-leafed; corol one-petalled; campanulate; styles two; seeds four. One species; a Cape plant, with creeping stem; leaves entire, and cut at the base.

FALKINGHAM, a town in Lincolnshire, with a market on Thursdays. Lat. 52. 48 N. Lon. 0. 20 W.

FALKIRK, a handsome town of Stirlingshire, in Scotland, chiefly supported by the great markets for Highland cattle, called trysts, which are held in its neighbourhood thrice a year: 15,000 head of cattle are sometimes sold at one tryst. Lat. 55. 57 N. Lon. 45. 8 W. Here are 8,838 inhabitants.

FALKLAND, a borough of Fifeshire, in Scotland, at the foot of one of the beautiful green hills called the Lomonds. Here are the magnificent ruins of a royal palace, some apartments of which are still inhabited. Lat. 56. 18 N. Lon. 3. 7 W.

FALKLAND ISLANDS, a cluster of islands near the Magellanic Streights. The English took possession of these islands in the name of his Britannic majesty in 1764, but abandoned them in 1774.

To FALL. *v. n.* pret. *I fell*; compound pret. *I have fallen* or *faln*, (feallan, Saxon.) 1. To drop from a higher place (*Shakspeare*). 2. To drop from an erect to a prone posture. 3. To drop; to be held no longer (*Acts*). 4. To move down any descent (*Burnet*). 5. To drop ripe from the tree (*Isaiah*). 6. To pass at the outlet: as a river (*Arbuthnot*). 7. To be determined to some particular direction (*Cheyne*). 8. To apostatize; to depart from faith or goodness (*Milton*). 9. To die by violence (*Milton*). 10. To come to a sudden end (*Davies*). 11. To be degraded from a high station (*Shakspeare*). 12. To decline from power or empire (*Addison*). 13. To enter into any state worse than the former (*Dryden*). 14. To decrease; to be diminished (*Arbuthnot*). 15. To ebb; to grow shallow. 16. To decrease in value; to bear less price. 17. To sink; not to amount to the full (*Bacon*). 18. To be rejected; to become null (*Locke*). 19. To decline from violence to calmness (*Shakspeare*). 20. To enter into any new state of the body or mind (*Knolles*). 21. To sink into an air of discontent or dejection of the look (*Bacon*). 22. To sink below something in comparison. 23. To happen; to befall (*Donne*). 24. To come by chance; to light on (*Shakspeare*). 25. To come in a stated method (*Holder*). 26. To come unexpectedly (*Boyle*). 27. To begin any thing with ardour and vehemence (*Hale*). 28. To handle or treat directly (*Addison*). 29. To come vindictively (*Chronicles*). 30. To come by any mischance to any new possessor (*Knolles*). 31. To drop or pass by carelessness or imprudence (*Swift*). 32. To come forcibly and irresistibly (*Acts*). 33. To become the property of any one by lot, chance, or otherwise (*Denham*). 34. To languish; to grow faint (*Addison*). 35. To be born; to be yeaned (*Mortimer*). 36. *To* FALL *away*. To grow lean (*Arbuthnot*). 37. *To* FALL *away*. To revolt; to change allegiance (*Kings*). 38. *To* FALL *away*. To apostatize (*Luke*). 39. *To* FALL *away*. To perish; to be lost. 40. *To* FALL *away*. To decline gradually; to fade; to languish (*Addison*). 41. *To* FALL *back*. To fail of a promise or purpose (*Taylor*). 42. *To* FALL *back*. To recede; to give way. 43. *To* FALL *down*. To prostrate oneself in adoration (*Psalms*). 44. *To* FALL *down*. To sink; not to stand. 45. *To* FALL *down*. To bend as a suppliant. 46. *To* FALL *from*. To revolt; to depart from adherence (*Hayward*). 47. *To* Fall *in.* To concur; to coincide. 48. *To* Fall *in.* To comply; to yield to. 49. *To* Fall *off.* To separate; to be broken. 50. *To* Fall *off.* To perish; to die away. 51. *To* Fall *off.* To apostatize; to revolt. 52. *To* Fall *on.* To begin eagerly to do any thing (*Dryden*). 53. *To* Fall *on.* To make an assault (*Shakspeare*). 54. *To* Fall *over.* To revolt; to desert from one side to the other (*Shakspeare*). 55. *To* Fall *out.* To quarrel; to jar (*Sidney*). 56. *To* Fall *out.* To happen; to befall (*Hooker*). 57. *To* Fall *to.* To begin eagerly to eat (*Dryden*). 58. *To* Fall *to.* To apply himself to (*Pope*). 59. *To* Fall *under.* To be subject to (*Taylor*). 60. *To* Fall *under.* To be ranged with (*Addison*). 61. *To* Fall *upon.* To attack; to invade. 62. *To* Fall *upon.* To attempt (*Holder*). 63. *To* Fall *upon.* To rush against (*Addison*).

To Fall. *v. a.* 1. To drop; to let fall (*Shakspeare*). 2. To sink; to depress (*Bacon*). 3. To diminish; to let sink (*Locke*). 4. To yean; to bring forth (*Shakspeare*).

Fall. *s.* (from the verb.) 1. The act of dropping from on high (*Dryden*). 2. The act of tumbling from an erect posture (*Shakspeare*). 3. The violence suffered in dropping from on high (*Locke*). 4. Death; overthrow; destruction incurred. 5. Ruin; dissolution (*Denham*). 6. Downfal; loss of greatness; declension from eminence; degradation (*Daniel*). 7. Declension of greatness, power, or dominion (*Hooker*). 8. Diminution; decrease of value (*Child*). 9. Declension or diminution of sound; cadence; close to music (*Milton*). 10. Declivity; steep descent (*Bacon*). 11. Cataract; cascade (*Pope*). 12. The outlet of a current into any other water (*Addison*). 13. Autumn; the fall of the leaf (*Dryden*). 14. Any thing that comes down in great quantities (*L'Estrange*). 15. The act of felling or cutting down.

Fall of man, in scripture history, that lamentable event by which sin and death were introduced into the world. The Mosaic account of the fall is detailed in the third chapter of Genesis; and need not be repeated here. This has been the topic of fruitful controversies, into which we are not disposed to enter. We do not see upon what principle any who call themselves Christians can deny the fall of man; since it was this fall alone which rendered the Christian dispensation necessary. It is this fact which is assumed as the basis, and without which there would be no place for the superstructure of redemption. Christ "came not to call the righteous, but sinners to repentance;" and we know of no hypothesis to account for the introduction of sin, but that laid before us in the Scriptures; where also we are furnished with a cure for this most dismal of all maladies: "for if by one man's offence death reigned by one; much more they which receive abundance of grace, and of the gift of righteousness, shall reign in life by one Jesus Christ. Therefore, as by the offence of one judgment came upon all men to condemnation; even so, by the righteousnes of one the free gift came upon all men unto justification of life," &c. Rom. v. 17, 18, 19.

As to the deistical, or, as it is now fashionable to call them, *philosophical* objections to the fall of man, those who are desirous to see it triumphantly proved how unphilosophical they are, may consult Delany's "Revelation examined with Candour," Dissertations 1, 2, and 6.

FALLA'CIOUS. *a.* (*fallacieux*, French.) 1. Producing mistake; sophistical (*South*). 2. Deceitful; mocking expectation (*Milton*).

FALLA'CIOUSLY. *ad.* Sophistically; with purpose to deceive (*Brown*).

FALLA'CIOUSNESS. *s.* Tendency to deceive; inconclusiveness.

FALLA'CY. *s.* (*fallacia*, Latin.) Sophism; logical artifice; deceitful argument (*Sidney*).

FALLIBI'LITY. *s.* (from *fallible*.) Liableness to be deceived; uncertainty (*Watts*).

FA'LLIBLE. *a.* (*fallo*, Latin.) Liable to error; such as may be deceived (*Taylor*).

FA'LLING. *s.* (from *fall*.) Indenting opposed to prominence (*Addison*).

Falling-sickness. See Epilepsia.

Fa'lling-stars. See Meteorology.

FALLOPIAN TUBE. See Tuba Fallopiana.

Fallopian ligament. See Poupart's ligament.

FALLOPIUS (Gabriel), an eminent physician and anatomist of Modena, was born in 1490. He discovered the tubes called thence Fallopian tubes. He was professor of anatomy, first at Pisa, and next at Padua, where he died in 1563. All his works were published in 3 vols. folio, at Venice, 1585 and 1606, and at Frankfort in 1600 and 1606.

FA'LLOW. *a.* (ꝼaleƿe, Saxon.) 1. Pale red, or pale yellow (*Clarendon*). 2. Unsowed; left to rest after the years of tillage (*Hayward*). 3. Plowed, but not sowed (*Howel*). 4. Unplowed; uncultivated (*Shakspeare*). 5. Unoccupied; neglected (*Hudibras*).

Fa'llow. *s.* (from the adjective.) 1. Ground plowed in order to be plowed again (*Mortimer*) 1. Ground lying at rest (*Rowe*).

To Fa'llow. *v. n.* To plow in order to a second plowing (*Mortimer*).

Fallow deer; deer bred in parks for the production of venison, as well as for ornament. The male is called a buck; the female, a doe; the offspring of both, a fawn: they slightly vary in colour, but are chiefly of a dark dingy brown, inclining to black, or a mottled sandy dun. The buck is furnished with horns, which he sheds yearly: the doe has no such weapons for self-defence.

The buck sheds his horns from the middle of April to the close of May, and for the most part regenerates them by the month of September. The doe generally produces her young in the last week of May, or by the middle of

June. The season for buck venison commences in July, and continues till about Michaelmas; when doe venison comes in, and continues till January. The rutting time, or season of procreation, commences at the latter end of August, and continues during the greater part of September.

Buck-hunting was formerly a much more common sport than at present, and a dwarf kind of stag-hounds, called buck-hounds, was kept for the purpose. The uncertainty, however, and short duration of the chase has nearly destroyed the practice; and there is, in the present day, hardly any such thing in the kingdom as a pack kept solely for the purpose of hunting fallow deer.

Fallow land. Land under no immediate cultivation, ploughed up and laid at rest, to acquire from its exposure to the oxygen of the air additional strength for the production of future crops. Of fallow lands there are two kinds, summer and winter; for which see Husbandry.

FA'LLOWNESS. *s.* (from *fallow*.) Barrenness; an exemption from bearing fruit (*Donne*).

FALMOUTH, a seaport of Cornwall, with a market on Thursday. About two centuries ago, there were not more than two or three houses, but it is now governed by a mayor, four aldermen, and a town-clerk. It has a very noble and extensive harbour, communicating with a number of navigable creeks; and it is a flourishing town of great traffic, which has been much improved by its being the station of the packets to Spain, Portugal, and America. Lat. 50. 8 N. Lon. 4. 58 W.

Falmouth, is also the name of a town in Jamaica, on the N. coast; of one in Virginia; and of a seaport in the state of Massachusets.

FALSE. *a.* (*falsus*, Latin.) 1. Not morally true; expressing that which is not thought (*Shakspeare*). 2. Not physically true; conceiving that which does not exist. (*Davies*). 3. Supposititious; succedaneous (*Bacon*). 4. Deceiving expectation (*L'Est.*). 5. Not agreeable to rule, or propriety (*Shak.*). 6. Not honest; not just (*Donne*). 7. Treacherous; perfidious; traiterous (*Shakspeare*). 8. Counterfeit; hypocritical; not real (*Dryden*).

False. *ad.* Not truly; falsely (*Shaksp.*).

False action, if brought against one whereby he is cast into prison, and dies pending the suit, the law gives no remedy in this case, because the truth or falsehood of the matter cannot appear before it is tried: and if the plaintiff is barred, or non-suited at common law, regularly all the punishment is amercement.

False imprisonment is a trespass committed against a person, by arresting and imprisoning him without just cause, contrary to law; or where a man is unlawfully detained without legal process: and it is also used for a writ which is brought for this trespass. If a person be any way unlawfully detained, it is false imprisonment; and considerable damages are recoverable in those actions.

False, when used in music, is applied to such chords as do not contain all the intervals appertaining to them in their perfect state: thus, a false fifth contains only six semitones.

False voice. See Voice.

False-quarter. In the manage, a cleft or chink in the side or quarter of a horse's hoof, running in an oblique or slanting direction with the horny fibres of it, from the coronet to its base, by which the horny substance of the crust is divided, and one part of the hoof is separated from the other, and consequently rendered unable to support the portion or share of weight which the limb should sustain. When the horse sets his foot to the ground, the crack widens, and when he lifts it up again the hardened edges of the divided hoof inclose betwixt them the tender and soft parts, and squeeze them so as frequently to occasion bleeding at the crack; nor is this all, for it often happens that the complaint is attended with inflammation of the parts, a discharge of matter, and consequent lameness. This complaint is occasioned in general by a wound or bruise upon the coronet, by which the continuity of parts is broken, for we always find that when the horny fibres of the hoof are divided at their roots, they seldom, or perhaps never, unite again, but leave a blemish of a greater or less extent, in proportion to the size or depth of the wound or bruise. From this account of the nature of the complaint, it is evident that a radical cure cannot possibly be effected, though we have it in our power so far to palliate it as to render the horse in a measure useful, by adopting a shoe of such a construction as will support the whole weight of the injured limb, without pressing too much upon the injured quarter; for which purpose a round, or what is commonly termed a barred shoe, is undoubtedly the most proper. The surface of the hoof on and near the diseased part should likewise be cut down lower than the surface of the crust upon which the shoe is to rest, or if the hoof will not admit of cutting down, the shoe may be raised up from the weak quarter; either of which methods of proceeding will remove the weight from the diseased part, and consequently the horse will not halt so much as before. Sand and gravel are easily admitted into the chink or crack, and accumulated there till they irritate and inflame the parts, in consequence of which matter forms underneath the hoof, which not unfrequently breaks out at the coronet, and produces the most inveterate ulcers—to heal which it is extremely difficult, on account of the sinus or fistula, commonly called a quittor, branching out in different directions under the hoof.—Horses that have this defect should be carefully attended to; and when the thick hardened parts or edges of the crack grow too high, by which it is rendered so much the deeper, and of consequence lodges a greater portion of sand, or other extraneous matter; these edges should be rasped down, or pared with a crooked knife, till the seam entirely disappears; but where there remains a blackness or appearance of gravel, the part must be traced further, always taking care not to draw blood if it can possibly be avoided. The crack being made smooth and equal, it will not be easy for sand or gravel to lodge in it, but as the parts will be tender, it will be proper to apply an emollient poultice for a few days, till the soreness subsides. If the inflammation had been great, and matter had formed in the crack in consequence thereof, or if the parts have been wounded by the knife, in paring down the hardened edges, fungus may perhaps shoot out and become troublesome. In which case the hard parts of the hoof near it are to be removed, and a digestive poultice applied.

False roots, in arithmetic and algebra, negative and impossible roots of numbers or equations. So the square root of 16 may be reckoned either 4 or —4, the former true, the latter false. The cube root of 1, is either 1, or $-\frac{1+\sqrt{-3}}{2}$, or $-\frac{1-\sqrt{-3}}{2}$, the latter two false or imaginary. Again, if r be the real root of any cube r^3, the two false roots of it will be $-\frac{1+\sqrt{-3}}{2}r$, and $-\frac{1-\sqrt{-3}}{2}r$.

To False. *v. a.* (from the noun.) Out of use. 1. To violate by failure of veracity (*Spenser*). 2. To deceive (*Spenser*). 3. To defeat; to balk; to evade (*Spenser*).

FALSEHE'ARTED. *a.* (*false* and *heart.*) Treacherous; perfidious; deceitful (*Bacon*).

FA'LSEHOOD. *s.* (from *false.*) 1. Want of truth; want of veracity (*South*). 2. Want of honesty; treachery (*Milton*). 3. A lie; a false assertion (*Job*). 4. Counterfeit; imposture (*Milton*).

FA'LSELY. *ad.* (from *false*). 1. Contrarily to truth; not truly (*Government of the Tongue*). 2. Erroneously; by mistake (*Smalridge*). 2. Perfidiously; treacherously; deceitfully.

FA'LSENESS. *s.* (from *false.*) 1. Contrariety to truth. 2. Want of veracity; violation of promise (*Tillotson*). 3. Duplicity; deceit (*Hammond*). Treachery; perfidy; traitorousness (*Rogers*).

FA'LSER. *s.* (from *false*). A deceiver (*Spenser*).

FALSETTO. (Italian.) That species of voice in a man, the compass of which lies above his natural voice, and is produced by artificial straining.

FALSIFI'ABLE. *a.* (from *falsify.*) Liable to be counterfeited or corrupted.

FALSIFICA'TION. *s.* (*falsification*, Fr.) 1. The act of counterfeiting any thing so as to make it appear what it is not (*Bacon*). 2. Confutation (*Broome*).

FA'LSIFIER. *s.* (from *falsify.*) 1. One that counterfeits; one that makes any thing to seem what it is not (*Boyle*). 2. A liar (*L'Estrange*).

To FA'LSIFY. *v. a.* (*falsifier*, French.) 1. To counterfeit; to forge (*Hooker*). 2. To confute; to prove false (*Addison*). 3. To violate; to break by falsehood (*Knolles*).

To Fa'lsify. *v. n.* To tell lies (*South*).

FA'LSITY. *s.* (*falsitas*, Lat.) 1. Falsehood; contrariety to truth (*Sandys*). 2. A lie; an errour (*Glanville*).

FALSTAFF. See Fastolff.

FALSO BORDONE, a musical term, which denotes that ground bass of an air whose notes move all in consecution.

FALSTER, a little island of Denmark, near the entrance of the Baltic, between the islands of Zealand, Laland, and Mona.

To FA'LTER. *v. n.* (*vaultur*, Islandick.) 1. To hesitate in the utterance of words (*Dryden*). 2. To fail in any act of the body (*Shakspeare*). 3. To fail in any act of the understanding.

To Fa'lter. *v. a.* To cleanse; to sift (*Mortimer*).

FA'LTERINGLY. *ad.* (from *falter.*) With hesitation; with difficulty; with feebleness.

FALX. (*falx.*) In anatomy. The falciform process of the dura mater. See Falciform process.

FAMA CLAMOSA, in the judicial procedure of the church of Scotland, a ground of action before a presbytery against one of its members, independent of any regular complaint by a particular accuser.

FAMAGUSTA (the ancient Arsinoe), an episcopal town of the island of Cyprus, in Asiatic Turkey. Lat. 35. 10 N. Lon. 35. 55 E.

To FA'MBLE. *v. n.* (*famler*, Danish.) To hesitate in the speech (*Skinner*).

FAME. *s.* (*fama*, Latin.) 1. Celebrity; renown (*Addison*). 2. Report; rumour (*Joshua*).

Fame (*Fama*), a heathen goddess, celebrated chiefly by the poets. She is feigned to be the last of the race of Titans produced by the earth, to have her palace in the air, and to have a vast number of eyes, ears, and tongues.

FA'MED. *a.* (from *fame.*) Renowned; celebrated; much talked of (*Dryden*).

FA'MELESS. *a.* Without fame (*May*).

FAMES CANINA. See Bulimia.

FAMI'LIAR. *a.* (*familiaris*, Latin.) 1. Domestic; relating to a family (*Pope*). 2. Affable; easy in conversation (*Shakspeare*). 3. Unceremonious; free (*Sidney*). 4. Well known (*Watts*). 5. Well acquainted with; accustomed (*Pope*). 6. Common; frequent (*Locke*). 7. Easy; unconstrained (*Addison*). 8. Too nearly acquainted (*Camden*).

Fami'liar. *s.* 1. An intimate; one long acquainted (*Rogers*). 2. A demon supposed to attend at call (*Shakspeare*).

Familiars of the Inquisition, persons who assist in apprehending such as are accused, and carrying them to prison. They are assistants to the inquisitors, and are called familiars because they belong to his family.

FAMILIA'RITY. *s.* (*familiarité*, French.) 1. Easiness of conversation; affability. 2. Acquaintance; habitude (*Atterbury*). 3. Easy intercourse (*Pope*).

To **FAMI'LIARIZE.** *v. a.* (*familiariser*, French.) 1. To make easy by habitude. 2. To bring down from a state of distant superiority (*Addison*).

FAMI'LIARLY. *ad.* (fom *familiar.*) 1. Unceremoniously; with freedom (*Bacon*). 2. Commonly; frequently (*Raleigh*). 3. Easily; without formality (*Pope*).

FAMI'LLE. (*en famille*, French.) In a family way; domestically (*Swift*).

FAMILIES, in natural history, any number of individuals, whether animals, vegetables or minerals, that resemble each other in a variety of prominent natural characters. The term is synonymous with tribes.

Families of vegetables. Linnéus (Philos. Bot.) divides the vegetable world into seven families. 1. Fungi. 2. Algæ. 3. Musci, or mosses. 4. Filices, or ferns. 5. Gramina, or grasses. 6. Palmæ, or palms. 7. Plantæ, or plants; including all that are not in the foregoing families. See Gentes.

M. Adanson published a system, under the title of Familles des Plantes. And the Lichfield society have given their translation of Linnéus's Genera Plantarum the same title, in English.

FA'MILY. *s.* (*familia*, Latin.) 1. Those who live in the same house; household (*Swift*). 2. Those that descend from one common progenitor; a race; a generation (*Numbers*). 3. A course of descent; a genealogy (*Pope*). 4. A class; a tribe; a species (*Bacon*).

Family of curves. See Curves.

FA'MINE. *s.* (*famine*, French.) Scarcity of food; dearth (*Hale*).

To **FA'MISH.** *v. a.* (from *fames*, Latin.) 1. To kill with hunger; to starve (*Shakspeare*). 2. To kill by deprivation or denial of any thing necessary to life (*Milton*).

To **Fa'mish.** *v. n.* To die of hunger; to suffer extreme hunger (*Shakspeare*).

FA'MISHMENT. *s.* Want of food (*Hakewill*).

FAMO'SITY. *s.* (from *famous.*) Renown.

FA'MOUS. *a.* (*famosus*, Lat.) Renowned; celebrated; much talked of (*Peacham*).

FA'MOUSLY. *ad.* With celebrity; with great renown (*Shakspeare*).

FA'MOUSNESS. *s.* Celebrity; great fame.

FAN. *s.* (*vannus*, Latin.) 1. An instrument used by ladies to move the air and cool themselves (*Atterbury*). 2. Any thing spread out like a woman's fan (*L'Estrange*). 3. The instrument by which the chaff is blown away when corn is winnowed (*Shakspeare*). 4. Any thing by which the air is moved (*Dryden*). 5. An instrument to raise the fire (*Hooker*).

To **Fan.** *v. a.* 1. To cool or recreate with a fan (*Spectator*). 2. To ventilate; to affect by air put in motion (*Milton*). 3. To separate, as by winnowing (*Bacon*).

Fan, a machine used to raise wind, and cool the air by agitating it. That the use of the fan was known to the ancients is very evident from what Terence says, "Cape hoc flabellum, et ventulum huic sic facito;" and from Ovid. Art. Amand. i. 171. "Profuit et tenues ventos movisse flabello." The fans of the ancients were made of different materials; but the most elegant were composed of peacock's feathers, or perhaps painted so as to represent a peacock's tail.

The custom which now prevails among the ladies of wearing fans was borrowed from the east, where the hot climate renders the use of fans and umbrellas indispensably necessary. The shape and construction of our modern fans are too well known to need any particular description.

Fan is also an instrument to winnow corn. The fan which Virgil calls mystica vannus Iacchi, was used in initiations into the mysteries of the ancients: for as the persons who were to be initiated into these mysteries were to be particularly good, this instrument, which separates the corn from the chaff, was a fit emblem of separating the good from the vicious and useless part of mankind. It is figuratively applied in a similar manner in Luke iii. 17.

FANLIGHT, in architecture, a name given to windows of nearly a semicircular form, the panes of which diverge from the centre, in resemblance of an open fan.

FANPALM, in botany. See Chamœrops.

FANA'TICISM. *s.* (from *fanatic.*) Enthusiasm; religious frenzy (*Rogers*).

FANA'TIC. *a.* (*fanaticus*, Latin.) Enthusiastic; struck with a superstitious frenzy (*Milton*).

Fana'tic. *s.* An enthusiast; a man mad with wild notions of religion (*D. of Piety*).

FA'NCIFUL. *a.* (*fancy* and *full.*) 1. Imaginative; rather guided by imagination than reason (*Woodward*). 2. Dictated by the imagination, not the reason; full of wild images (*Hayward*).

FA'NCIFULLY. *ad.* According to the wildness of imagination.

FA'NCIFULNESS. *s.* Addiction to the pleasures of imagination (*Hale*).

FA'NCY. *s.* (*phantasia*, Latin.) 1. Imagination; the power by which the mind forms to itself images and representations of things or persons. (See Imagination.) 2. An opinion bred rather by the imagination than the reason (*Clarendon*). 3. Taste; idea; conception of things (*Addison*). 4. Image; conception; thought (*Shakspeare*). 5. Inclination; liking; fondness (*Collier*). 6. Caprice; humour; whim (*Dryden*). 7. Frolic; idle scheme; vagary (*L'Estrange*). 8. Something that pleases or entertains (*Bacon*).

To **Fa'ncy.** *v. n.* To imagine; to believe without being able to prove (*Locke*).

To **Fa'ncy.** *v. a.* 1. To portray in the mind; to imagine (*Dryden*). 2. To like; to be pleased with (*Raleigh*).

FA'NCYMONGER. *s.* One who deals in tricks of imagination (*Shakspeare*).

FA'NCYSICK. *a.* One whose distemper is in his own mind (*L'Estrange*).

FANDANGO, a dance much practised in Spain, and of which the natives of that coun try are particularly fond. Its air is lively, and much resembles the English hornpipe. (*Busby*).

FANE. *s.* (*fane*, French; *fanum*, Latin.) A temple; a place consecrated to religion (*Philips*).

FA'NFARON. *s.* (French.) 1. A bully; a hector (*Dryden*). 2. A blusterer; a boaster of more than he can perform (*L'Estrange*).

FANFARONA'DE. *s.* (from *fanfaron.*) A bluster; a tumour of fictitious dignity (*Swift*).

To **FANG.** *v. a.* (ꝼanȝan, Saxon.) To seize; to gripe; to clutch (*Shakspeare*).

FANG. *s.* (from the verb.) 1. The long tusks of a boar or other animal by which the prey is seized (*Shakspeare*). 2. The nails; the talons. 3. Any shoot or other thing by which hold is taken (*Evelyn*).

FA'NGED. *a.* (from *fang.*) Furnished with fangs or long teeth; furnished with any instruments in imitation of fangs (*Phillips*).

FA'NGLE. *s.* (from ꝼenȝan, Saxon.) Silly attempt; trifling scheme.

FA'NGLED. *a.* (from *fangle.*) Gaudy; ridiculously showy; vainly decorated (*Shakspeare*).

FA'NGLESS. *a.* (from *fang.*) Toothless; without teeth (*Shakspeare*).

FA'NGOT. *s.* A quantity of wares.

FANIONS, in the military art, small flags carried along with the baggage.

FA'NNEL. *s.* (*fanon*, French.) A sort of ornament like a scarf, worn about the left arm of a mass priest when he officiates.

FA'NNER. *s.* One that plays a fan (*Jeremiah*).

FANO, an ancient episcopal town of Urbino, in Italy, 20 miles E. of Urbino. Lat. 43. 46 N. Lon. 13. 5 E.

FA'NTASIED. *a.* (from *fantasy.*) Filled with fancies or imaginations (*Shakspeare*).

FANTA'SM. *s.* See PHANTASM.

FANTA'STICAL. FANTA'STIC. *a.* (*fantastique*, French.) 1. Irrational; bred only in the imagination. 2. Subsisting only in the fancy; imaginary. 3. Unreal; apparent only (*Shakspeare*). 4. Uncertain; unsteady; irregular (*Prior*). 5. Whimsical; fanciful; capricious (*Addison*).

FANTA'STICALLY. *ad.* (from *fantastical.*) 1. By the power of imagination. 2. Capriciously; humorously (*Shakspeare*). 3. Whimsically (*Grew*).

FANTA'STICALNESS. FANTA'STICNESS. *s.* 1. Humorousness; mere compliance with fancy. 2. Whimsicalness; unreasonableness (*Tillotson*). 3. Caprice; unsteadiness.

FA'NTASY. *s.* (from *fantaisie*, French.) 1. Fancy; imagination; the power of imagining (*Newton*). 2. Idea; image of the mind (*Spenser*). 3. Humour; inclination (*Whitgift*).

FANTIN, a small kingdom of Guinea, in Africa, where the English and Dutch have forts. The principal town or village has the same name.

FANUM, a temple, or place consecrated to some deity.

FAP. *a.* Fuddled; drunk (*Shakspeare*).

FAR. *ad.* (ꝼeoꞃ, Saxon.) 1. To great extent in length (*Prior*). 2. To a great extent every way (*Prior*). 3. To a great distance progressively (*Shakspeare*). 4. Remotely; at a great distance (*Knolles*). 5. To a distance (*Raleigh*). 6. In a great part (*Judges*). 7. In a great proportion; by many degrees. 8. To a great height; magnificently (*Shakspeare*). 9. To a certain point or degree (*Tillotson*). 10. *Off* is joined with *far*, when *far* noting distance is not followed by a preposition: as *I set the boat* far off, *I set the boat* far from *me*.

FAR-FETCH. *s.* A deep stratagem (*Hudibras*).

FAR-FETCHED. *a.* 1. Brought from places remote (*Milton*). 2. Studiously sought; elaborately strained (*Shakspeare*).

FAR-PIERCING. *a.* Striking or penetrating a great way (*Pope*).

FAR-SHOOTING. *a.* Shooting to a great distance (*Dryden*).

FAR. *a.* 1. Distant; remote (*Dryden*). 2. *From* FAR. From a remote place (*Deut.*).

FAR. *s.* (contracted from *farrow.*) Young pigs (*Tusser*).

To **FARCE.** *v. a.* (*farcio*, Latin.) 1. To stuff; to fill with mingled ingredients (*Carew*). 2. To extend; to swell out (*Shakspeare*).

FARCE was originally a droll, petty shew, or entertainment, exhibited by charletans, or quacks, and their buffoons, in the open street, to gather the crowd together.

The word is French, and signifies literally, *force-meat* or *stuffing*. It was applied on this occasion, without doubt, on account of the variety of jests, jibes, tricks, &c. wherewith the entertainment was interlarded. Some authors derive farce from the Latin *facetia*; others from the Celtic *farce*, mockery; others from the Latin *farcire*, to stuff. At present, farce is removed from the street to the theatre; and instead of being performed by merry-andrews to amuse the rabble, is now acted by our comedians, and become the entertainment of the politest audiences. The poets have reformed the wildness of the primitive farces, and brought them to the taste and manner of comedy. The difference between the two on our stage, is that the latter keeps to nature and probability; and, in order to that, is confined to certain laws, unities, &c. prescribed by the ancient critics. The former disallows of all laws, or rather sets them all aside on occasion. Its end is purely to please, or to make merry; and it sticks at nothing which may contribute thereto, however wild and extravagant. Hence the dialogue is usually low, the persons of inferior rank, and the fable or action trivial or ridiculous; and nature and truth are every where heightened and exaggerated to afford the more palpable ridicule.

FA'RCICAL. *a.* (from *farce.*) Belonging to a farce; appropriated to a farce.

FARCTOUS. (*farcio*, to stuff or cram.) In botany, stuffed, crammed, or full; without any vacuities.—*Farctum folium*; a stuffed leaf, full of pith or pulp; in opposition to *tubulous* and *fistulous*, tubular or hollow like a pipe.—It is applied also to the stem and pericarp.

FARCY. (from *farce*, on account of its intumescence.) In the manage. A disease peculiar to the horse, the ass, and the mule; bearing a striking resemblance to the glanders, only that this latter is for the most part a local affection, or commences as such, and is capable of being produced by inoculation with the purulent matter of the glanders. It is evidently a disease of the lymphatic system, rendering it incapable, in the glands that are affected, of secreting their accustomed and healthy juices, and of propelling the fluids which they have absorbed along their accustomed course. These in consequence stagnate, inflame the vessels in which they are confined, and a variety of tumours, ulcerations, and the discharge of a foul sanies follow.

At the commencement of the disease, a considerable enlargement and rigidity may be perceived in the affected absorbent, accompanied by much pain and inflammation. Glandular tumours are observed to arise, at first extremely sensible, but soon becoming schirrous: small ulcerations (called farcy buds) are soon visible, discharging a foul and corroding sanies; the edges of these buds are thick and hard, and the whole has an unhealthy aspect. If these symptoms are permitted to increase, the discharge becomes absorbed into the circulation; the system, consequently, is speedily and totally tainted, the ulcers spread with considerable rapidity, and few parts of the skin will remain long free from them; the sheath enlarges, as also the extremities; the coat stares, and the skin attaches itself closely to the body. At such a period it will be no easy undertaking to afford permanent relief; but where we have an opportunity of encountering the malady in its primary stages, we have a right to entertain very sanguine hopes of success.

Calomel, or other preparations of mercury, given as alteratives, and continued daily till commotion be excited, or nearly so, appears to afford the best mode of internal treatment: extreme cleanness, emollient lotions, thorough grooming, and the application of digestive ointment to the ulcers, with gentle exercise, is the most adviseable external treatment.

Where the animal is full in flesh, rowels will frequently prove of much advantage; but they can seldom be employed with propriety in lean and debilitated habits.

The disease termed WATER-FARCY, by old farriers, is completely dropsical, and may be owing either to a deficiency in the absorbents, or to an increased action of the secreting vessels; but, we believe, more particularly to the latter. In such cases we can discover no enlargement in the absorbents, nor is there the same appearance of ulceration as in the true farcy. It is usually removed, without much difficulty, by diuretics, or mild purgatives; but in more obstinate instances mercury must here also be had recourse to.

FA'RDEL. *s.* (*fardello*, Italian.) A bundle; a little pack (*Shakspeare*).

FARDING-DEAL, or FARDING-LAND, in our old customs, a rood, or fourth part of an acre.

To FARE. *v. n.* (faran, Saxon.) 1. To go; to pass; to travel (*Fairfax*). 2. To be in a state good or bad (*Waller*). 3. To proceed in any train of consequences good or bad (*Milton*). 4. To happen to any one well or ill (*South*). 5. To feed; to eat (*Brown*).

FARE. *s.* (from the verb.) 1. Price of passage in a vehicle by land or by water (*Dryden*). 2. Food prepared for the table; provisions.

In London the fares of Hackney-coaches, and of boats on the Thames, are established by law: tables of these fares may be found in most large accounts of London, and in several annual pocket-books.

FAREHAM, a town of Hampshire, having a market on Wednesdays, 74 miles W. by S. of London.

FAREWE'LL. (Cape), the most southerly promontory of Greenland, lying at the entrance of Davis's Streight. Lat. 59. 38 N. Lon. 42. 30 W.

The same name is given to a promontory of New Zealand. Lat. 40. 37 S. Long. 172. 41 E.

FAREWE'LL. *ad.* 1. The parting compliment; adieu (*Shaksp*). 2. It is sometimes used only as an expression of separation without kindness (*Waller*).

FAREWE'LL. *s.* Leave; act of departure (*Shakspeare*).

FARFARA, (*farfara*, from *farfarus*,) (the white poplar, so called because its leaves resemble those of the white poplar). See TUSSILAGO.

FARI'NA. (*farina*, from *far*, corn, of which it is made). Meal or flour. A term given to the pulverulent and glutinous part of wheat and other seeds, which is obtained by grinding and sifting. It is highly nutritious, and consists of gluten, starch, and mucilage. See WHEAT, and POLLEN.

FARINACEOUS. A term given to all articles of food which contain farina. See FARINA.

FARLEW, money paid by the tenant in the west of England, in lieu of a heriot.

FARM, FARIN, or FERM, (*firma*), in law, signifies a little country messuage or district, containing house and land, with other conveniencies; hired, or taken by lease, either in writing, or parole under a certain yearly rent. (See LEASE.) This in divers parts is differently termed: in the north it is a tack; in Lancashire, a fermeholt; in Essex, a wike, &c. In the corrupted Latin, *firma* signified a place inclosed or shut in: whence, in some provinces, Menage observes, they call closerie or closure, what in others they call a farm. Add, that we find *locere ad firmam*, to signify, to let to farm; probably on account of the sure hold the tenant here has, in comparison of tenants at will.

Spelman and Skinner, however, choose to derive the word farm from the Saxon *fearme*, or *feorme*, that is, *victus*, provision; because the country people and tenants anciently paid their rents in victuals and other necessaries, which were afterwards converted into the payment of a sum of money. Whence a farm was originally a place that furnished its landlord with provisions. And among the Normans they still distinguish between farms that pay in kind, i. e. provisions, and those which pay in money; calling the former simply *fermes*, and the latter *blanche ferme*, white ferm.

Spelman shows, that the word *firma* anciently signified not only what we now call a farm, but also a feast or entertainment, which the farmer gave the proprietor or landlord for a certain number of days, and at a certain rate for the lands he held of him. Thus *fearme* in the laws of king Canute is rendered by Mr. Lambard *victus*: and thus we read of *reddere firmam unius noctis*, and *reddebat unum diem de firma*; which denote provision for a night and a day, the rents about the time of the conquest being all paid in provisions: which custom is said to have been first altered under king Henry I. We also say to farm duties, imposts, &c.

FARM (Culture of a). See HUSBANDRY.

To FARM. *v. a.* (from the noun.) 1. To let out to tenants at a certain rent (*Sh.*). 2. To take at a certain rate (*Camden*). 3. To cultivate land.

FA'RMER. *s.* (*fermier*, French.) 1. One who cultivates hired ground (*Shak*). 2. One who cultivates ground (*Mortimer*).

FARMER (Hugh), a learned divine among the dissenters. He was descended from a respectable family in Merionethshire, and educated under Dr. Doddridge at Northampton. Early in life he settled at Walthamstow as pastor to the dissenting congregation there, and soon after his going to that place he was invited to take up his residence at the house of Mr. Snell, a gentleman of fortune, who delighted in his conversation. Here he continued till his death, which happened Feb. 5, 1787. Mr. Farmer is known by a Dissertation on Miracles, 8vo.; a Treatise on the Worship of Human Spirits in the ancient Heathen Nations, 8vo.; on Christ's Temptation, 8vo.; and on the Demoniacs, 8vo.

FARMER (Richard), a learned English divine and antiquary. He was born at Leicester in 1735, and educated at Emanuel college, Cambridge, where he proceeded to his degree of D. D. In 1775, he was chosen master of his college, and the same year served the office of vice chancellor. Lord North gave him a prebend in the cathedral of Canterbury, which he resigned on obtaining a residentiaryship of St. Paul's. He had also some other church preferment, and was a fellow of the royal and antiquarian societies. The doctor died in the autumn of 1797.

Though a good classical scholar, Dr. Farmer has been celebrated only for that kind of literature which is connected with the English drama, and having a strong predeliction for old English writers, he ranked high among the commentators upon Shakspeare. His essay upon the Learning of Shakspeare, dedicated to Mr. Cradock, the intelligent resident of Gumley-Hall in Leicestershire, has passed through several editions. This essay was, in fact, the first foundation of his fame, which an unconquerable indolence prevented him from carrying to that height to which the exercise of his literary talents could not have failed to raise it. So great indeed was his love of ease, that after having announced for subscriptions a history of Leicestershire, and actually begun to print it, rather than submit to the fatigue of carrying it through the press, he returned the subscriptions, and presented the MSS. and plates to Mr. Nichols, the respectable printer of the Gentleman's Magazine, who has since carried on the history with a degree of spirit, ability, and industry, perhaps unprecedented in this department of literature.

Indolence and the love of ease were indeed the Doctor's chief characteristics; and to them may be chiefly attributed a want of propriety in his external appearance, and in the usual forms of behaviour belonging to his station. The prevailing features of his character distinguished themselves by several oddities: There were three things, it was said, which the master of Emanuel loved, viz. old port, old clothes, and old books; and three things which no one could persuade him to perform, viz. to rise in the morning, to go to bed at night, and to settle an account. His accounts with some of his pupils, when tutor of his college, were never settled to the day of his death; and the young gentlemen not unfrequently took advantage of this unconquerable indolence, to borrow of him considerable sums, well knowing that there was little chance of a demand being ever made upon their parents. When in Cambridge, if an old house were pulled down, the master of Emanuel was always there in an old blue great coat, and a rusty hat. When in London, he was sure to be found in the same garb at an old book-stall, or standing at the corner of a dirty lane, poring through his glass at an old play-bill. By his enemies he is admitted to have been a man of generosity. As he obtained money easily, so he parted with it easily. Whilst he was always ready to relieve distress, his bounty was frequently bestowed on the patronage of learned men, and learned publications. He was, accordingly, a favourite with all who knew him. In his own college he was adored; in the university, he had, for many years, more influence than any other individual; and, with all his eccentricities, his death was a loss to that learned body, which, in the opinion of some of its members, will not soon be made up.

FA'RMOST. *a.* (superlative of *far.*) Most distant; remotest (*Dryden*).

FARN ISLANDS, two groups of little islands and rocks, 17 in number, lying opposite to Bamborough castle in Northumberland. At low water, the points of several others are visible, besides those above mentioned. The nearest island to the shore is called the House island, and lies exactly one mile and 68 chains from the coast. The most distant is about seven or eight miles. Their produce is kelp, feathers, and a few seals, which the tenant watches and shoots for the sake of the oil and skins. Some of them yield a little grass, that may serve to feed a cow or two; which the the people transport over in their little boats. The largest, or House island, is about one mile in compass, and has a fort and a light-house. It contains about six or seven acres of rich pasture; and the shore abounds with good coals, which are dug at the ebb of tide.

FA'RNESS. *s.* (from *far.*) Distance; remoteness (*Carew*).

FARNHAM, a town of Surrey, having a market on Thursdays, for wheat, oats, and barley. It is 39 miles W. S.W. of London. Lat. 51. 16 N. Lon. 0. 46 W.

FARNOVIANS, in ecclesiastical history, a sect of Socinians, so called from Stanislaus Farnovius, who separated from the other Unitarians in the year 1568, and was followed by several persons eminent for their learning. This sect did not last long; for, having lost their chief, who died in 1615, it was scattered abroad, and reduced to nothing.

FARO, an island of Sweden, near the island of Gothland, about 30 miles in circuit. The chief town has the same name. Lat. 57. 60 N. Long. 19. 7 E.

FARO, or PHARO. (*faro*, Italian; from φαρος, *pharos*, a *covering*, *mask*, or *integument*; and hence, in a secondary sense, a *lanthorn* or *light-house*, as affording a covering or protection to the lamp, or candle.) A game at cards invented at Venice, and, in its earlier and less complicated state, known by the name of *Bassetta*, or *Basset*; whence Dennis, "Gamesters would no more be known, and lady Dabcheek's *Basset-bank* would be broke." It appears to have been communicated to our own country from France.

This is often written, but erroneously, *Pharaoh*, or *Pharaon*, as though it were derived from the common title of the monarchs of antient Egypt, instead of from the Greek φαρος (pharos); whence the Italian *faro*; in which last country, this game originated, and where the term was formerly used, as among the Greeks, to imply a cloak, covering, veil, or mask.

The reason of this name the reader will perceive as he peruses our account of it, which will embrace the rules of the game; the method of playing it; its peculiar glossary, and scale of odds or chances.

Rules of the game.—The banker turns up the cards from a complete pack, deliberately, one by one, laying them alternately, first to his right for the bank, and then to his left hand for the punter, till the whole are dealt out.

The punter may, at his option, set any number of stakes, agreeable to the sum limited, upon one or more cards chosen out of his livret, from the ace to the king inclusive, either previous to dealing the cards, or after any quantity of coups are made, or he may mask his bets, or change his cards whenever he pleases, or finally decline punting, except an event is unsettled when not above eight cards are undealt.

The banker wins when the card equal in points to that on which the stake is set turns up on his right hand, but loses when it is dealt to the left.

The punter loses half the stake when his card comes out twice in the same coup.

The last card neither wins nor loses.

The last card but one is called hocly, and forms part of the banker's gain; but now is frequently given up, and generally so in the last deal.

When by accident or design the pack happens to contain more or less than fifty-two cards, or should the last coup be found deficient, owing to any misdeal, however arising, whether discovered at the end or during the game, the bank must then pay every stake depending at the period when the error is detected, which payment must also be made if the cards are thrown up.

The dealer should hold the cards close in his hand, and always be prepared to inform any punter how many cards remain.

The first card is never valid till the second is dealt.

No person but the dealer or croupier should ever meddle with the cards, unless to cut them.

A paroli, &c. may be purchased by paying a sum equivalent to the stake.

Method of play.—The tailleur and croupier sit opposite each other, at a large oval table covered with a green cloth, on which is a line marked by coloured tape, or a wooden rim about an inch high, and eight from the edge of the table, for the purpose of separating those cards punted on from the others. Money is placed either loose in a well, or done up in rouleaus. The tailleur is to deal, while the croupier pays and receives, guards against errors, and shuffles another pack of cards.

The game may be played by any number of persons, each punter being furnished with a livret, from which having chosen a card, or cards, and placed the same on the table, just within the line, putting the stake either thereon, or upon other cards placed face downwards at the head of those betted on. The stakes are answered by the banker, who usually limits the sums according to his capital; and at public tables has generally two or more croupiers. Then the dealer having previously counted and shuffled the cards, and had them cut by a punter, should hold the pack tight in his hand, and shew the bottom card as a caution to avoid punting on it near the conclusion of the game, and to prevent mistakes, a similar card, with the corners cut off, is usually laid in the middle of the table; next he says play, and proceeds to deal slowly, first to the right, afterwards to the left, mentioning every one as he goes on, and stopping between each two cards, while the croup settles the event.

When a punter gains, he may either take his money or paroli; if he wins again, he may play sept & le va; should he then prove successful, he can paroli for quinze & le va; afterwards for trente & le va; and finally, for soixante & le va; which is the highest chance in the game. Should the punter not like to venture so boldly, he may make a paix or pont; afterwards a double or treble paix, &c. or a single, double, or treble paix-paroli.

When doublets are dealt, the punter may either pay or make a pli.

A reckoning may be kept of the number of times each card is dealt, by properly placing a livret and bending the corners of similar cards, one way for the punter, another way for the dealer.

Glossary.—*Banker*; the person who keeps the table.

Cocking. See paroli.

Couche or *enjeu*; the stake.

Coup; a stroke or pull. Any two cards dealt alternately to the right and left.

Croupier; croup. An assistant to the dealer.

Doublet. Is when the punter's card is turned up twice in the same coup, then the bank wins half the stake. A single paroli must be taken down, but if there are several, only one retires.

Hocly; a certainty. Signifies the last card but one, the chance of which the banker claims, and may refuse to let any punter withdraw a card when eight or less remain to be dealt.

Livret; a small book. A suit of thirteen cards, with four others called *figures*, viz. one, named the little figure, has a blue cross on each side, and represents ace, duce, tray; another, yellow on both sides, styled the yellow figure, signifies four, five, six; a third, with a black lozenge in the centre, named the black figure, stands for seven, eight, nine, ten; and a red card, called the great or red figure, for knave, queen, king: these figures are useful for those who punt on several cards at once.

L'une pour l'autre; one for the other. Means a drawn game, and is said when two of the punters' cards are dealt in the same coup.

Mask. Signifies turning a card, or placing another face downwards, during any number of coups, on that whereon the punter has staked, and which he afterwards may display at pleasure.

Oppose; the opposite game. Is reversing the game, and having the cards on the right for the punter, and those on the left for the dealer.

Paix; peace. Equivalent to double or quits; is, when the punter, having won, does not choose to paroli and risque his stake, but bends or makes a bridge of his card, signifying that he ventures his gains only. A double paix is, when the punter having won twice, bends two cards one over the other. Treble paix, thrice, &c. A paix may follow a sept, quinze, or trente, &c.

Paix-paroli. Is when a punter has gained a paroli, wishes then to play double or quits, and save his original stake, which he signifies by doubling a card after making his first paroli; double paix-paroli succeeds to winning a paix-paroli; treble paix-paroli follows double, &c.

Paroli or *parolet*; double. Sometimes called cocking, is when a punter, being fortunate, chuses to venture both his stake and gains, which he intimates by bending a corner of his card upwards.

Pli; bending. Is used when a punter, having lost half his stake by a doublet, bends a card in the middle, and setting it up with the points and foot towards the dealer, signifies thereby a desire either of recovering the moiety, or of losing all.

Pont; a bridge. The same as paix.

Ponte or *punt*; a point. The punter or player.

Quinze et le va; fifteen and it goes. Is when the punter having won a sept, &c. bends the third corner of the card, and ventures for 15 times his stake.

Sept et le va; seven, &c. Succeeds the gaining of a paroli, by which the punter being entitled to thrice his stake, risks the whole again, and bending his card a second time, tries to win seven-fold.

Soixante et le va; sixty-three, &c. Is when the player having obtained a trente, ventures all once more, which is signified by making a fifth paroli, either on another card, if he has parolied on one only before, or by breaking the side of that one which contains four, to pursue his luck in the next deal.

Tailleur; the dealer. Generally the banker.

Trente et le va; one and thirty. Follows a quinze, &c. when the punter again tries his luck, and makes a fourth paroli.

Odds or chances at the game.—The chances of doublets vary according to the number of similar cards remaining among those undealt.

The odds against the punter increase with every coup that is dealt.

When twenty cards remain in hand, and the punter's card but once in it, the banker's gain is 5 per cent.

When the punter's card is twice in twenty, the banker's gain is about the 34th part of the stake.

When the punter's card is thrice in twenty, the banker's gain is about 4 per cent.

When the punter's card is four times in twenty, the banker's gain is nearly the 18th part of the stake.

When only eight cards remain, it is 5 to 3 in favour of the bank; but when but six are left, it is 2 to 1; and when no more than four, it is 3 to 1.

Table exhibiting the odds against winning any number of events successively, equally applicable to Hazard, Billiards, Faro, Rouge, and Noir, or other games of chance.

That the punter wins or loses the first time is an even bet. That he does not win twice together, is 3 to 1; three successive times, 7 to 1; four successive times, 15 to 1; five successive times, 31 to 1; six successive times, 63 to 1; seven successive times, 127 to 1; eight successive times, 255 to 1; nine successive times, 511 to 1; ten successive times, 1023 to 1; and so on to any number, doubling every time the last odds, and adding one for the stake.

N. B. A punter plays on the square by placing a stake, referring to both at the head of two cards that have been dealt thrice each, and neither of which is the bottom one.

Table disclosing, at the first view, the several advantages of the Banker, in whatever circumstances he may be placed.

Number of Card in the Stock.	The Number of Times the Punter's Card is contained in the Stock.			
	1	2	3	4
52	**	**	**	50
50	**	94	65	48
48	48	90	62	46
46	46	86	60	44
44	44	82	57	42
42	42	78	54	40
40	40	74	52	38
38	38	70	49	36
36	36	66	46	34
34	34	62	44	32
32	32	58	41	30
30	30	54	38	28
28	28	50	36	26

Number of Cards in the Stock.	The Number of Times the Punter's Card is contained in the stock.			
	1	2	3	4
26	26	46	33	24
24	24	42	30	22
22	22	38	28	20
20	20	34	25	18
18	18	30	22	16
16	16	26	20	14
14	14	22	17	12
12	12	18	14	10
10	10	14	12	8
8	8	11	9	6

Application of the table.—I. To find the gain of the banker when there are thirty cards remaining in the stock, and the punter's card twice in it. In the first column seek for the number answering to 30, the number of cards remaining in the stock: over against it, and under 2, at the head of the table, you will find 54, which shews that the banker's gain is the 54th part of the stake.

II. To find the gain of the banker when but ten cards are remaining in the stock, and the punter's card thrice in it. Against 10, the number of cards in the first column, and under number 3, you will find 12, which denotes that the banker's gain is the 12th part of the stake.

III. To find the banker's profit when the punter's cards remain twice in twenty-two. In the first column find 22, the number of cards, over against it under figure 2, at the head of the table, you find 38, which shews that the gain is one 38th part of the stake.

IV. To find the banker's gain when eight cards remain, and the punter's card thrice among them. In the first column seek for 8, on a line with which, under the 3, stands the figure of 9, denoting the profits to be 1-9th, or 2s. 4d. in the guinea.

Corollary 1.—From the table it appears, that the fewer cards there are in the stock, the greater is the gain of the banker.

Corollary 2.—The least gain of the banker under the same circumstance, is when the punter's card is but twice in hand, the next greater when three times, still greater when but once, and the greatest of all when four times. The banker's profit is 3 per cent. upon all the sums adventured, supposing the punter's to stop when only six cards remain; but with hocly, it is full 5 per cent.

FARO DI MESSINA, a promontory of Sicily, at the entrance of the streight between Italy and Sicily. It had formerly a lighthouse for the direction of mariners.

FARO, an episcopal town of Algarve, in Portugal. It was taken by Alphonso, king of Portugal, from the Moors, in 1429. Lat. 37. 14 N. Long. 7. 48 W.

FARO, FARRO, or FEROE ISLANDS, a cluster of small islands, in the Northern Ocean, between 5 and 8° W. long. and 61 and 63° N. lat. They are subject to Denmark. Seventeen are habitable, each of which is a lofty mountain, divided from the others by deep and rapid currents. Some of them are deeply indented with secure harbours, all of them steep, and most of them faced with tremendous precipices. The surface consists of a shallow soil of remarkable fertility; producing plenty of barley, and fine grass for sheep. No trees above the size of a juniper, or stunted willow, will grow here; nor are any quadrupeds to be seen, except sheep, and rats and mice, originally escaped from ships. Vast quantities of sea-fowls frequent the rocks, and the taking of them furnishes a perilous employment for the inhabitants. See BIRD-CATCHING.

FARQUHAR (George), a celebrated comic poet, born at Londonderry in Ireland, in 1678, and educated at Trinity college, Dublin, which he soon quitted to join a company of comedians. Not succeeding in Ireland, he went to London, and soon after received from the earl of Orrery a lieutenancy in his lordship's own regiment. In 1698, appeared his first dramatic piece, entituled, Love in a Bottle, which was well received. In 1700 he brought out his Constant Couple, or Trip to the Jubilee; and at the end of the same year he was in Holland, of which country he has given a humorous description in two of his letters. In 1701 appeared his comedy called Sir Harry Wildair, or the sequel to the Trip to the Jubilee: and the year following his Miscellanies, or Collection of Poems, Letters, and Essays. In 1703 he brought out the Inconstant, or the Way to win him.

His next piece was the popular play of the Recruiting Officer, dedicated to all friends round the Wrekin, a famous hill near Shrewsbury. His last performance was the Beaux Stratagem, which had a great run. The author died in the midst of its success, in 1707. He left two daughters in very poor circumstances, but they were kindly provided for by Wilks the actor.

FARRA'GINOUS. *a.* (from *farrago*, Lat.) Formed of different materials (*Brown*).

FARRA'GO. *s.* (Latin.) A mass formed confusedly of several ingredients; a medley.

FARREATION, in antiquity. See CONFARREATION.

FARRIER, or FERRIER. (*ferrarius*. from ferrum, *iron*, Latin, the metal he works upon.) One who forges horse-shoes, and fixes them on. In most villages, from his association with horses, he is styled the horse-doctor; but the diseases of this noble animal, and indeed of domestic quadrupeds in general, having been lately studied scientifically in Europe, under the appellation of veterinary medicine, we shall here regard the farrier as the mere mechanic or horse-shoe-maker, and refer the reader for whatever else relates to farriery to the article VETERINARY MEDICINE.

To FA'RRIER. *v. n.* (from the noun.) To practice surgery and give medicine to horses.

FARRIERY, the art of curing, palliating, or preventing the diseases of horses, called of late years, and since the subject has employed the attention of scientific persons, the veterinary art. See **Veterinary medicine**, and **Veterinary college**.

FARRINGDON, a town in Berks, with a market on Tuesdays. Lat. 51. 44 N. Lon. 1. 27 W.

FA'RROW. *s.* (ꝼeaꞃh, Saxon.) A litter of pigs (*Shakspeare*).

To Fa'rrow. *v. a.* To bring pigs (*Tusser*).

FARS, or Farsistan, one of the most fertile provinces of Persia, in Asia. It is bounded by Kerman on the E. by Irac Agemi on the N. by Chusistan on the W. and by the Gulph of Bussorah on the S. In this province are the ruins of the famous Persepolis.

FART. *s.* (ꝼeꞃꞇ, Saxon.) Wind from behind (*Suckling*).

To Fart. *v. a* (from the noun.) To break wind behind (*Swift*).

FARTACK, a town of Arabia Fœlix, in Asia. It is the capital of a kingdom of the same name. Lat. 15. 20 N. Lon. 51. 25 E.

FA'RTHER. *ad.* (We ought to write *further* and *furthest*, ꝼoꞃðeꞃ, ꝼuꞃðeꞃ, Saxon.) At a greater distance; to a greater distance; more remotely; beyond; moreover (*Locke*).

Fa'rther. *a.* (supposed from *far*, more probably from *forth*, and to be written *further.*) 1. More remote (*Dryden*). 2. Longer; tending to greater distance (*Dryden*).

To Fa'rther. *v. a.* (more proper *to further.*) To promote; to facilitate; to advance (*Dryd.*).

FA'RTHERANCE. *s.* (more properly *furtherance.*) Encouragement; promotion (*Asc.*).

FARTHERMO'RE. *ad.* (more properly *furthermore.*) Besides; moreover (*Raleigh*).

FA'RTHEST *ad.* (more properly *farthest.*) At the greatest distance; to the greatest distance.

Fa'rthest. *a.* Most distant; remotest.

FA'RTHING. *s.* (ꝼeoꞃðlinᵹ, Saxon.) 1. The fourth of a penny (*Cocker*). 2. Copper money (*Gay*). 3. It is used sometimes in a sense hyperbolical; as, it is not worth a *farthing*; or proverbial.

Farthing of gold, denotes in ancient books, ¼th of a noble.

FA'RTHINGALE. *s.* A hoop, used to spread the petticoat (*Swift*).

FA'RTHINGSWORTH. *s.* As much as is sold for a farthing (*Arbuthnot*).

FASCES, in antiquity, axes tied up together with rods or staves, and borne before the Roman magistrates, as a badge of their office and authority. In funeral processions it was customary to carry the fasces reversed, as a token of grief.

FA'SCIA. (*fascia*, from *fascis*, a bundle; because by means of a band materials are collected into a bundle.) In anatomy. A bandage, fillet, or roller: hence the aponeurotic expansions of muscles, which bind parts together, are termed fasciæ.

Fascia, in antiquity, a thin sash, which the Roman women wrapped round their bodies, next to their skin, in order to make them slender.

Fascia, in architecture. See **Face**.

Fascia, in astronomy. See **Belts**.

Fascia lata, in anatomy, a thick and strong tendinous expansion sent off from the back, and from the tendons of the glutei and adjacent muscles, to surround the muscles of the thigh. It is thickest on the outside of the thigh and leg, but towards the inside of both becomes gradually thinner. A little below the trochanter major, it is firmly fixed to the linea aspera; and, farther down, to that part of the head of the tibia that is next the fibula, where it sends off the tendinous expansion along the outside of the leg. It serves to strengthen the action of the muscles, by keeping them firm in their proper places when in action, particularly the tendons that pass over the joints where this membrane is thickest.

FASCIALIS. In anatomy. (*fascialis, musculus.*) See **Tensor vaginæ femoris**.

FA'SCIATED. *a.* (from *fascia*, Latin.) Bound with fillets; tied with a bandage.

FASCIA'TION. *s.* (*fascia*, Latin.) Bandage; the act of binding diseased parts (*Wiseman*).

FA'SCICLE. (*fasciculus.*) A small volume, or bundle; a livret.

Fa'scicle. (*fasciculus*, from *fascis*, a bundle.) In botany. A species of inflorescence, or manner of flowering, in which several upright, parallel, fastigiate, approximating flowers are collected together: as in dianthus barbatus. Colligit flores erectos, parallelos, fastigiatos, approximatos. Hence

Fascicular root. A species of the tuberous, with the knobs collected in bundles as in pæonia.

Fasciculate leaves. Fascicled leaves. In botany. Growing in bundles or bunches from the same point, as in larix.

To FA'SCINATE. *v. a.* (*fascino*, Latin.) To bewitch; to enchant; to influence in some wicked and secret manner (*Decay of Piety*).

FASCINA'TION. *s.* (from *fascinate.*) The power or act of bewitching; enchantment; unseen inexplicable influence (*South*).

Fascina'tion. (*fascinatio*, Latin; βασκανια, Greek; *quasi*, φασκανια—παρα το φαεσι καινειν, *oculis, aspectu, occidere.*) Incantation; witchcraft; an occult power possessed, or supposed to be possessed, by one animal of operating upon another to its injury or destruction.

This is a subject which has never been thoroughly investigated; and a full examination of which would lead us far beyond the limits to which we are necessarily confined. We can only advert to a few particulars, which we should like to see comprehensively and rationally discussed: and we must for the present offer them without advancing any opinion of our own.

In all ages, and amidst all nations, animals of various kinds have been supposed to possess, either naturally, or by acquirement, a secret or occult control over other animals, sometimes communicated imperceptibly, sometimes through the medium of the eyes, which is the precise meaning of the term fascination: and sometimes through that of spells or sounds, which is the proper meaning of incantation, which has hitherto, though incorrectly, been regarded as its synonym.

Man has been supposed in all ages, and in almost all countries, to have at times possessed such a control over his fellow man. Hence, the magicians of ancient Egypt; the inchanters of Persia and Arabia; the necromancers and sorcerers, the φαρμακοι and venefici of Greece and Rome; the witches, wizards, and weirds of the northern tribes. The idea is encouraged in the sacred scriptures; and distinct allusions are made, both in the Old and New Testaments, to a possession of this preternatural control.

We shall next observe, that a similar control appears to be exercised still, and to have been exercised from time immemorial, by man in a certain state of endowment, over other animals; and we now chiefly allude to the fascinating power of the ancient psylli of Egypt, and to various tribes of African barbarians over the entire race of serpents, the most poisonous of which they are capable of handling, and even of eating up alive, from foot to head, without sustaining the smallest injury whatever; the reptile, in every instance, appearing to sicken and to become deprived of power from the first moment it is seized, and implicitly resigning itself to the will of the fascinator. This assertion of ancient and modern historians has indeed been ridiculed by M. Denon, and his philosophic associates, but without any kind of authority whatever, and merely because it is a power, which, when in Egypt, they were not able either to comprehend or unravel. The concurrent testimony of the most honest and best informed travellers of all ages prove the existence of the fact. Bruce was an eye-witness to it in a variety of cases, and once or twice submitted to a preparation, which he was told by the tribes who were thus naturally gifted, would afford him an equal power, though only for a short period of time; but his heart in every instance misgave him after he had been prepared, and he was afraid to make the trial.

But it is not man only, who is from age to age reported to possess this occult control over his own and various other genera; but other animals are equally reported to possess a similar control.

Among the Roman philosophers and historians, the lion was believed to be in this manner charmed and deprived of all energy, by some occult power lodged in the game cock. Pliny makes particular mention of this fact, and ascribes it to the influence of the cock's comb. Nat. Hist. viii. 18. Lucretius, who, though a poet, was less apt to depend upon unauthenticated reports, alludes to the same fact, as a circumstance generally known and ascertained; but instead of ascribing the effect to the cock's comb, refers it, more plausibly at least, to the penetrative power of his eye.

Quem etiam gallum, noctem explodentibus alis,
Auroram clarâ consuetum voce vocare,
Nenec queunt rapidei contra constare leones,
Inque tueri? ita continuo meminere fugaï.
De Rer. Nat. iv. 714.

The lion, thus, the cock's indignant eye
Flies, nor can e'er encounter, loud of wing
Who drives the shadows, and the lazy dawn
Wakes with shrill clarion, iterated oft.

There are various other instances of fascination said to be exercised by one animal over another, to which we might advert if we had space; but we must limit ourselves to the very extraordinary power of this kind, generally admitted to belong to the serpent race, and more especially to the rattle-snake; and which, though chiefly exercised upon birds and the smaller quadrupeds, is affirmed by some writers, yet without sufficient authority, to have been extended to the horse, and even to man himself.

We will first advert to the observations of M. Vaillant, in his travels into the interior parts of Africa. On the confines of the European colony, at a place called Swortland, he tells us that he saw a shrike on the branch of a tree, tremble as if in convulsions, whilst it uttered the most piercing cries of distress. Closer attention led him to discover upon the next branch of the same tree a large serpent, that, with stretched-out neck, and fiery eyes, though perfectly still, was gazing on the poor animal. He shot the serpent; but, in the mean time, the bird had died. Having measured the distance between the place where the shrike was seen in convulsions, and that occupied by the serpent when it was shot, he found it to be three feet and a half; which convinced him and his attendants, that the bird had not died either from the bite or the poison of its enemy. Indeed he stripped it before the whole company, and made them observe that it was untouched, and had not received the slightest wound. In another district of Africa, during the course of the same travels, he saw a small mouse die in convulsions, occasioned by the fascinating power of a serpent, at the distance of two yards from it; and when he consulted his Hottentots upon this incident, he assures us, that they expressed no sort of astonishment, but asserted that the serpent has the faculty of attracting and fascinating such animals as it wishes to devour. He produces one instance of similar fascination upon a human subject, a captain in the Dutch service, who, after assuring our traveller that it is an event which happens very frequently, proceeded thus: "My testimony ought to have the more weight, as I had once nearly become myself a victim to this fascination. While in garrison at Ceylon, and amusing myself, like you, in hunting in a marsh, I was, in the course of my sport, suddenly seized with a convulsive and involuntary trembling, different from any thing I had ever experienced, and at the same time was strongly attracted, and in spite of myself, to a particular spot of the marsh. Directing my eyes to this spot, I beheld, with feelings of horror, a serpent of an enormous size, whose look instantly pierced me. Having, however, not yet lost all power of motion, I embraced the opportunity before it was too late, and saluted the reptile with the contents of my fusee. The report was a talisman that broke the charm. All at once, as if by a miracle, my convulsion ceased; I felt myself able to fly; and the only inconvenience of this extraordinary adventure was a cold sweat, which was doubtless the effect of my fear, and of the violent agitation my senses had undergone."

We have read of various cases of human fascination, by the same means; but they have uniformly been accompanied with either a sudden or a steady view of the fascinating animal. We do not think that any of them are sufficiently supported for belief; but we should certainly be much more tempted to believe such cases than the case before us, in which the fascination preceded the view.

Of all the serpent tribe, however, the rattlesnake is said to possess this extraordintry faculty in the highest degree; and hence the fascination has been conjectured by some writers to reside in the rattle itself, instead of in the eyes. One of the first who started this idea was Dr. Mead; and his opinion has been of late years supported by a similar belief, on the part of professor Blumenbach of Gottingen. "With respect to the use of the rattle," says Dr. Mead, "a vulgar error has obtained even among the learned. It is commonly said that it is a kind of contrivance of Providence, to give warning to passengers, by the noise which this part makes when the creature moves, to keep out of the way of its mischief. Now, this is a mistake. It is beyond all dispute, that wisdom and goodness shine forth in the works of the Creator: but the contrivance here is of another kind than is imagined. All the parts of animals are made either for the preservation of the individual, or for the propagation of its species. This before us is for the service of the individual. This snake lives chiefly upon squirrels and birds, which a reptile can never catch, without the advantage of some management to bring them within its reach. The way is this: The snake creeps to the foot of a tree, and by shaking his rattle, awakens the little creatures which are lodged in it. They are so frighted at the sight of their enemy, who fixes his lively, piercing eyes upon one or other of them, that they have no power to get away, but leap about from bough to bough till they are quite tired, and at last, falling to the ground, they are snapped into his mouth! This is by the people of the country called *charming* the squirrels and birds."

But, if various serpents, that have no rattle, be possessed, as they appear to be, of the same power, then the argument no longer holds good. On this account, a third hypothesis has been offered, which consists in ascribing the fascinating influence to a vapour or miasm which issues from the body of the serpent, and produces so extraordinary an effect: while a fourth opinion has been started still later, which consists in denying the existence of any fascinating power whatever

The most strenuous supporter of this last opinion is professor Barton of Philadelphia, who wrote a memoir upon this subject, in 1796, in which he stated his objections at full length, admitting indeed the fact, but controverting the mode of accounting for it upon any occult or recondite principle. "The snake," says he, "whatever its species may be, lying at the bottom of the tree or bush upon which the bird or squirrel sits, fixes its eyes upon the animal it designs to fascinate or enchant. No sooner is this done, than the unhappy animal is unable to make its escape. It now begins to utter a most piteous cry, which is well known by those who hear it and understand the whole machinery of the business, to be the cry of a creature enchanted. If it is a squirrel, it runs up the tree for a short distance, comes down again, then runs up, and lastly, comes lower down. The snake still continues at the foot of the tree, with its eyes fixed on the squirrel, with which its attention is so entirely taken up, that a person accidentally approaching may make a considerable noise, without the snake's so much as turning about. The squirrel, as before mentioned, comes always lower, and at last leaps down to the snake, whose mouth is already wide open for its reception. The poor little animal then, with a piteous cry, runs into the snake's jaws and is swallowed at once, if it be not too big; but if its size will not allow it to be swallowed at once, the snake licks it several times with its tongue, and smoothens it, and by that means makes it fit for swallowing."

Having thus stated the fact, the writer next enters into the question of a fascinating influence, and the various modes we have already adverted to, by which it is accounted for, and each of which he determines to be equally nugatory. With respect to the theory of an emitted vapour, "I know," says he, "that in some of the larger species of serpents, inhabiting South America and other countries, there is evolved in the stomach, during the long and tedious process of digestion in these animals, a vapour or a gas, whose odour is intensely fetid. I have not, however, found that this is the case with the rattle snake and other North American serpents that I have examined. But my own observations on this head have not been very minute. I have made inquiry of some persons (whose prejudices against the serpent tribe are not so powerful as my own), who are not afraid to put the heads and necks of the black snake, and other serpents that are destitute of venomous fangs, into their mouths, and have been informed, that they never perceived any disagreeable smell to proceed from the breath of these animals. I have been present at the opening of a box which contained a number of living serpents; and although the box had been so close as to admit but a very small quantity of fresh air, although the observation was made in a small warm room, I did not perceive any peculiarly disagreeable effluvium to arise from the bodies of these animals. I am, moreover, informed by a member of this society, who has, for a considerable time, had a rattle-snake under his immediate care, that he had not observed that any disagreeable vapour proceeds from this reptile. On the other hand, however, it is asserted by some creditable persons of my acquaintance, that a most offensive odour, similar to that of flesh in the last stage of putrefaction, is continually emanating from every part of the rattle-snake, and some other species of serpents. This odour extends, under certain circumstances, to a considerable distance from the body of the animal. Mr. William Bartram assures me, that he has observed 'horses to be sensible of, and greatly agitated by it, at the distance of forty or fifty yards from the snake. They shewed (he says) their abhorrence by snorting, winnowing, and starting from the road, endeavouring to throw their riders, in order to make their escape.' This fact, related by a man of rigid veracity, is extremely curious; and in an especial manner deserves the attention of those writers who imagine that this fetid emanation from serpents is capable of affecting birds, at small distances, with a kind of asphyxy."

The professor concludes with observing, that "the result of not a little attention to the subject, has taught me that there is but one wonder in the business;—the wonder that the story should ever have been believed by a man of understanding and of observation." Fascination, adds he, is chiefly limited to birds that build low, and "in almost every instance, I found that the supposed fascinating faculty of the serpent was exerted upon the birds at the particular season of their laying their eggs, of their hatching, or of their rearing their young, still tender and defenceless. I now began to suspect, that the cries and fears of birds, supposed to be fascinated, originated in an endeavour to protect their nest or young. My inquiries have convinced me that this is the case." He imagines that the old birds are merely caught by a courageous advancing, rather than by a fearful and retreating fluttering—a fluttering intended to frighten away the serpent itself; and that in exercising this sleight, it advances too far, and falls a prey to its own temerity.

We cannot say that we are convinced by this reasoning; and still less are we satisfied with the argument adduced to prove that the fascinating power may not exist in a vapour or effluvium thrown forth from the body of the serpent, because, in such case, it would be generally discoverable by a specific odour. What odour accompanies the vapour, that issuing from the surface of the electric eel, exhausts the muscular power of the hand that attempts to grasp it? It is in like manner, perhaps, an effluvium equally specific that agitates the nervous system of various persons, who are peculiarly affected, and may be said to be fascinated by the presence of a cat. The writer of this article has witnessed such agitation, and under circumstances in which the cat was not seen or known to be present; and where the agitation took place on the moment of the cat's introduction into the room; and yet in no such cases is the effect attended with a sense of any kind of odour, either to the person affected, or to by-standers, who are free from such affection. In reality, the finest vapours and the purest gasses we are acquainted with have neither odour nor any other sensible quality by which we can distinguish them, and are only to be ascertained by their effects. Miasms and contagions have seldom, perhaps never, any odour, unless combined with other materials; light, caloric, and oxygen are equally destitute. We do not, then, contend that the efflux of vapour from the surface of serpents is the cause of fascination, but only that the argument has not been fairly met and rebutted by the present objection.

We cannot conclude this article better than in the words of Mr. Pennant: "Of the fascinating power of the rattle-snake, it is difficult to speak. Authors of credit describe the effects. Birds have been seen to drop into its mouth; squirrels descend from their trees, and leverets run into its jaws. Terror and amazement seem to lay hold on these little animals: they make violent efforts to get away, still keeping their eyes fixed on those of the snake; at length, wearied with their movements, and frightened out of all capacity of knowing the course they ought to take, they become the prey of the expecting devourer, probably in their last convulsive motion."

FASCINES, in fortification, faggots of small wood of about a foot diameter, and six feet long, bound in the middle and at both ends. They are used in raising batteries, making chandeleers, in filling up the moat to facilitate the passage to the wall, in binding the ramparts where the earth is bad, and in making parapets of trenches to screen the men.

FA'SCINOUS. *a.* (*fascinum*, Lat.) Caused or acting by witchcraft: not in use (*Harvey*).

FASCIOLA. Gourdworm. Flake. In zoology, a genus of the class vermes, order intestina. Body flattish, with an aperture, or pore at the head, and generally another at a distance beneath, seldom a single aperture. These are hermaphrodite, oviparous, and are generally found in the stomach, intestines, or liver; the intestines are flexuous and the ovaries lateral. Forty-six species.

A. Infesting Mammals.
B. ——— Birds.
C. ——— Reptiles.
D. ——— Fishes.
E. ——— Worms.

The tribe A. of different species is found in man, the fox, polecat, badger, long-eared bat, sheep, swine, deer, horse, and stag. B. in the eagle, buzzard, kite, duck, crane, goose, bittern. C. salamander, frog. D. eel, whiting, haddock, blenny, father-lasher, plaise, perch, salmon, trout, pike, and bream. E. cuttle-fish.

The most common species is E. hepatica, or liver-flake, with body ovate and sharper before, with a white line down the middle, and spot in the centre; inhabiting the liver of sheep, which often vomits it up in brooks; generally found fixed by a pore at the extremity and another in the middle of the abdomen, and occasions or is produced by, dropsy and the disorder called the rot.

Body about an inch long; broader on the fore part, and terminated by a tube; the back marked with about eight longitudinal furrows in two series. See the article Rot.

FA'SHION. *s.* (*façon*, French.) 1. Form; make; state of any thing with regard to outward appearance (*Luke*). 2. The make or cut of clothes (*Shakspeare*). 3. Manner; sort; way (*Hayward*). 4. Custom operating upon dress, or any domestic ornaments (*Shakspeare*). 5. Custom; general practice (*Tillotson*). 6. Manner imitated from another; way established by precedent (*Shakspeare*). 7. General approbation; mode (*Pope*). 8. Rank; condition above the vulgar (*Raleigh*). 9. Any thing worn (*Shakspeare*). 10. The farcy, a distemper in horses (*Shakspeare*).

To Fa'shion. *v. a.* (*façonner*, French.) 1. To form; to mould; to figure (*Raleigh*). 2. To fit; to adapt; to accommodate (*Spenser*). 3. To counterfeit: not used (*Shakspeare*). 4. To make according to the rule prescribed by custom (*Locke*).

Fashion pieces, in the sea language, the aftmost or hindmost timbers of a ship, which terminate the breadth, and form the shape of the stern. They are united to the stern-post, and to the extremity of the wing transom, by a rabbit, and a number of strong nails or spikes driven from without.

FA'SHIONABLE. *a.* (from *fashion.*) 1. Approved by custom; established by custom; modish (*Rogers*). 2. Made according to the mode (*Dryden*). 3. Observant of the mode (*Shakspeare*). 4. Having rank above the vulgar, and below nobility.

FA'SHIONABLENESS. *s.* (from *fashionable.*) Modish elegance (*Locke*).

FA'SHIONABLY. *ad.* (from *fashionable.*) In a manner conformable to custom; with modish elegance (*South*).

FA'SHIONIST. *s.* (from *fashion.*) A follower of the mode; a fop; a coxcomb.

FAST, in general, denotes an abstinence from food, but is more particularly used for such abstinence on a religious account.

Religious fasting has been practised by most nations from the remotest antiquity. Some divines even assign its origin to the earthly paradise, where our first parents were forbidden to eat of the tree of knowledge. But though this seems carrying the matter too far, it is certain that the Jewish church has observed fasts ever since its first institution. Nor were the neighbouring heathens, viz. the Egyptians, Phœnicians, and Assyrians, without their fasts. The Egyptians, according to Herodotus, sacrificed a cow to Isis, after having prepared themselves by fasting and prayer: a custom which he likewise ascribes to the women of Cyrene. Porphyry affirms, that the Egyptians, before their stated sacrifices, always fasted a great many days, sometimes for six weeks; and that the least behoved to be for seven days; during all which time the priests and devotees not only abstained from flesh, fish, wine, and oil, but even from bread, and some kinds of pulse. These austerities were communicated by them to the Greeks, who observed their fasts much in the same manner. The Athenians had the Eleusinian and Thesmophorian fasts, the observation of which was very rigorous, especially among the women, who spent one whole day sitting on the ground in a mournful dress, without taking any nourishment. In the island of Crete, the priests of Jupiter were obliged to abstain all their lives from fish, flesh, and baked meats. Apuleius informs us, that whoever had a mind to be initiated in the mysteries of Cybele were obliged to prepare themselves by fasting ten days; and, in short, all the pagan deities, whether male or female, required this duty of those that desired to be initiated into their mysteries of their priests and priestesses that gave the oracles, and of those that came to consult them.

Though fasting is not positively enjoined by Christ or his apostles, a custom prevailed among the first Christians of joining abstinence with their prayers, especially when they were engaged in affairs of extraordinary importance. But in the most ancient times we find no mention of any public and solemn fasts, except upon the anniversary of Christ's crucifixion. However, in process of time, days of fasting were gradually introduced, first by custom, and afterwards by positive appointment; though it is not certain what those days were, nor whether they were observed in the first century. Mr. Mosheim acknowledges, that those who affirm, that in the time of the apostles, or soon after, the fourth and sixth days of the week were observed as fasts, are not destitute of specious arguments in favour of their opinion. Eccles. Hist. vol. i. p. 106. 8vo.

To **Fast.** *v. n.* (*fastan*, Goth. ꝼæꞅꞇan, Saxon.) 1. To abstain from food (*Bacon*). 2. To mortify the body by religious abstinence (*Matthew*).

Fast. *a.* (ꝼæꞅꞇ, Saxon.) 1. Firm; immovable (*Milton*). 2. Strong; impregnable (*Spenser*). 3. Fixed; adhering (*Temple*). 4. Deep; sound (*Shakspeare*). 5. Firm in adherence (*Ascham*). 6. (from *ffest*, Welch.) Speedy; quick; swift (*Davies*). 7. Fast *and loose*. Uncertain; variable; inconstant; deceitful (*Sidney*).

Fast. *ad.* 1. Firmly; immovably (*Shakspeare*). 2. Closely, nearly (*Knolles*). 3. Swiftly; nimbly (*Daniel*). 4. Frequently (*Hammond*).

Fast-days, are those appointed by public authority to be observed by fasting and humiliation. The Church of England enjoins 16 vigils or fasts before holidays, 40 fasts in lent, 12 ember days, 3 rogation days, 4 solemn days, and all Fridays in the year. Besides which there is generally an annual fast in time of war.

To **FA'STEN.** *v. a.* (from *fast.*) 1. To make fast; to make firm (*Dryden*). 2. To hold together; to cement; to link. 3. To affix; to conjoin (*Swift*). 4. To stamp; to impress; to fix (*Shakspeare*). 5. To unite inseparably (*Decay of Piety*). 6. To lay on with strength (*Dryden*).

To **Fa'sten.** *v. n.* To fix one's self (*Brown*).

FA'STENER. *s.* (from *fasten.*) One that makes fast or firm.

FA'STER. *s.* (from *fast.*) He who abstains from food.

FASTERMANS, or **Fasting-men**, in our old customs, denoted men in repute and substance, who were responsible for each other's behaviour.

FA'STHANDED. *a.* (*fast* and *hand.*) Avaricious; closehanded; covetous (*Bacon*).

FASTI, in Roman antiquity, the kalendar wherein were expressed the several days of the year, with their feasts, games, and other ceremonies. There were two sorts of fasti, the greater, or *fasti magistralis*, and the less, or *fasti kalendares*. The fasti magistrales contained, besides the several feasts, &c. the birth-days and other circumstances relating to the magistrates and emperors. The fasti kalendares were also of two kinds, urbani and rustici; the former contained an account of the feasts and ceremonies observed in the city; the latter, of those observed in the country, which were fewer, as too much time taken up in this way would interfere with the cultivation of the earth.

Fasti was also a chronicle of time, wherein noted events were registered according to the years of the respective consuls.

Fasti, or **dies fasti**, likewise denoted court-days.

FASTIDIO'SITY. *s.* (from *fastidious.*) Disdainfulness; contemptuousness (*Swift*).

FASTI'DIOUS. *a.* (*fastidiosus*, Lat.) Disdainful; squeamish; insolently nice (*South*).

FASTI'DIOUSLY. *a.* Disdainfully; contemptuously; squeamishly (*Government of the Tongue*).

FASTIGIATE. (*fastigium*, the pointed top, or roof of a building.) In botany, applied to various parts of a plant. A fastigiate stem, having branches of an equal height. Peduncles are fastigiate, when they elevate the fructifications in a bunch, so that they are all of an equal height, as if they had been shorn off horizontally, or when they are so proportioned, as to form an even surface at top, like a flat roof: as in dianthus and silene. A fastigiate umbel, an umbel rising gradually. This is a different idea from the former; and in Philos. Botan. the umbellate flower is thus described: est aggregate ex flosculis pluribus insidentibus receptaculo in pedunculos fastigiatos, omnes ex eodem puncto productos. Here we are probably to understand *fastigiatos* in the former sense of level-topped: but it is doubtful how Linnéus came to annex this idea to *fastigium* and its derivatives; since roofs are not flat in northern countries; and although they be so in the east, and in some parts of Italy, yet *fastigiatus* seems rather applied to lofty and pointed buildings. Thus Solinus, speaking of the pyramids—turres sunt, in Ægypto fastigiatæ, ultra celsitudinem omnem, quæ fieri manu possit.

FASTIGIUM, in architecture. See PEDIMENT

FASTING, the abstaining from food. Many extraordinary stories have been related of long continued fasting. Sir William Hamilton gives an account of two fattened hogs, that lay buried under a heap of ruins in Soriano, and were taken out alive the 42d day. And, in the shipwreck of the Juno off the coast of Aracan, in the year 1795, those persons who survived the wreck lived 23 days without any other sustenance than what was derived from the sea-water which they sucked out of their garments.

FA'STINGDAY. *s.* (*fast* and *day.*) Day of mortification by religious abstinence (*Taylor*).

FA'STNESS. *s.* (from *fast.*) 1. State of being fast. 2. Firmness; firm adherence (*Bacon*). 3. Strength; security (*Davies*). 4. A strong place; a place not easily forced. 5. Closeness; conciseness: not used (*Ascham*).

FASTOLFF (sir John), a famous general, born at Yarmouth in Norfolk, in 1377. He served with great glory in France, where he obtained several high posts while the English held their possessions in that kingdom. In 1440 he returned home covered with laurels, and his conduct afterwards shewed that he deserved them; for he was bountiful to the poor, and a liberal encourager of learning. He left a considerable legacy for building the schools of philosophy and civil law at Cambridge, and was a great benefactor to Magdalen college, Oxford. He died in 1459. Shakspeare has been censured for abusing this excellent man, under the ludicrous character of sir John Falstaff; but it is probable that the poet had no thoughts of ridiculing Fastolff, and that the coincidence is merely accidental.

FA'STUOUS. *a.* (*fastuosus*, Latin.) Proud; haughty.

FAT. *a.* (ꝼæꞇ, Saxon.) 1. Full-fed; plump; fleshy (*Arbuthnot*). 2. Coarse; gross; dull (*Dryden*). 3. Wealthy; rich (*Milton*).

FAT. (*adeps.*) A concrete oily matter contained in the cellular membrane of animals, of a white or yellowish colour, with little or no smell or taste. It differs in all animals in solidity, colour, taste, &c. and likewise in the same animal at different ages. In infancy it is white, insipid, and not very solid; in the adult it is firm and yellowish, and in animals of an advanced age, its colour is deeper, its consistence various, and its taste in general stronger.

It is collected in particular follicles of the cellular membrane, accumulated in the groin, epiploon, around the kidnies and blood-vessels; and is secreted on the surface of the skin by a set of minute glands, on this account called sebacic, where it sometimes concretes, chiefly, though not always, from want of cleanliness, and exhibits the appearance of small worms: it is accumulated from diminished perspiration; from the nature of the aliments fed on; and from idiosyncrasy. It forms sometimes steatomatous humours, and, by the possession of a small quantity of oxygen, contains the sebacic acid, which acts readily on vessels of lead, copper, and iron, in which it is often deposited for culinary purposes.

Fats and oils are commonly divided into spermaceti, fat properly so called, fish or thran-oil, and empyreumatic oil, extracted by distillation from many vegetable and animal substances. Chemically analysed it is found to possess five parts out of six of carbon, and one of hydrogen, with a very small portion, as already observed, of oxygen. Fat meat is nourishing to those that have strong digestive powers. It is used externally as a softening remedy, and enters into the composition of ointments and plaisters.

To **FAT.** *v. n.* To grow fat; to grow full-fleshed (*L'Estrange*).

To **FAT.** *v. a.* (from the noun.) To make fat; to fatten; to make fleshy (*Abbot.*).

FATA MORGANA, by the French denominated *mirages*, a very remarkable phenomenon, which is sometimes observed from the harbour of Messina and adjacent places, at a certain height in the atmosphere. The name which signifies the *Fairy Morgana* is derived from an opinion of the superstitious Sicilians, that the whole spectacle is produced by fairies, or such like visionary invisible beings. The populace are delighted whenever it appears; and run about the streets shouting for joy, calling every body out to partake of the glorious sight.

This singular meteor has been described by various authors; but the first who mentioned it with any degree of precision was father Angelucci, who observed it in 1643. His account does not differ very materially from that given by P Minasi in his Dissertation on this phænomenon, published in 1773. But as the latter is more minute, we present part of it to our readers: "When the rising sun shines from that point whence its incident ray forms an angle of about 45° on the sea of Reggio, and the bright surface of the water in the bay is not disturbed either by the wind or the current, the spectator being placed on an eminence of the city, with his back to the sun and his face to the sea, on a sudden there appear in the water, as in a catoptric theatre, various multiplied objects, that is to say, numberless series of pilasters, arches, castles well delineated, regular columns, lofty towers, superb palaces, with balconies and windows, extended alleys of trees, delightful plains with herds and flocks, armies of men on foot and horseback, and many strange images in their natural colours and proper actions, passing rapidly in succession along the surface of the sea during the whole of the short period of time while the above-mentioned causes remain. But, if in addition to the circumstances before described, the atmosphere be highly impregnated with vapour, and dense exhalations not previously dispersed by the action of the wind or waves, or rarefied by the sun, it then happens that in this vapour, as in a curtain, extended along the channel to the height of about 30 palms, and nearly down to the sea, the observer will behold the scene of the same objects not only reflected from the surface of the sea, but likewise in the air, though not so distinct or well defined as the former objects from the sea. Lastly, if the air be slightly hazy and opake, and at the same time dewy, and adapted to form the iris, then the above-mentioned objects will appear only at the surface of the sea, as in the first case, but all vividly coloured or fringed, with red, green, blue, and other prismatic colours."

Minasi, therefore, distinguishes three sorts of Fata Morgana: that is to say, the first at the surface of the sea, which he calls the Marine Morgana; the second in the air, called the Aërial Morgana; and the third only at the surface of the sea, which he calls the Morgana fringed with prismatic colours.

Different accounts have been given of this singular appearance; M. Houel attributes it to a bitumen that issues from certain rocks at the bottom of the sea, and which is often seen to cover a part of its surface in the canal of Messina. The subtle parts of this bitumen being attenuated, combined, and exhaled with the aqueous globules that are raised by the air, and formed into bodies of vapour, give to this condensed vapour more consistence; and contribute, by their smooth and polished particles, to the formation of a kind of aërial crystal, which receives the light, reflects it to the eye, and transmits to it all the luminous points which colour the objects exhibited in this phenomenon, and render them visible.

A curious print, exhibiting the Fata Morgana, may be seen in Nicholson's Journal, vol. 1. 4to. Some further particulars respecting this singular phenomenon may also be seen in No. 52 of Tilloch's Philosophical Magazine.

By Mr. Good it is very plausibly resolved into *striæ* or strata of different densities in the atmosphere. See his translation of Lucretius, note to vol. ii. p. 25.

FA'TAL. *a.* (*fatalis*, Latin.) 1. Deadly; mortal; destructive (*Dryden*). 2. Proceeding by destiny; inevitable; necessary (*Tillotson*). 3. Appointed by destiny (*Bacon*).

FA'TALIST. *s.* (from *fate*.) One who maintains that all things happen by invincible necessity (*Watts*).

FATA'LITY. *s* (*fatalité*, French.) 1. Predestination; predetermined order or series of things and events (*South*). 2. Decree of fate (*King Charles*). 3. Tendency to danger (*Brown*).

FA'TALLY. *ad.* (from *fatal*.) 1. Mortally; destructively, even to death (*Dryden*). the decree of fate (*Bentley*).

FA'TALNESS. *s.* (from *fatal*.) Invincible necessity.

FATE, FATUM, denotes an inevitable necessity, depending upon a superior cause. The word is formed *a fando*, from speaking: and primarily implies the same with *effatum*, viz. a word or decree pronounced by God; or a fixed sentence, whereby the Deity has prescribed the order of things, and allotted to every person what shall befall him. The Greeks called it *ειμαρμενη*, as it were a chain or necessary series of things indissolubly linked together. It is also used to express a certain unavoidable designation of things, by which all agents, both necessary and voluntary, are swayed and directed to their ends. See NECESSITY. In this last sense, fate is distinguished into, 1. Astrological fate, arising from the influence and position of the heavenly bodies; which (it is supposed) gave laws both to the elements and mixed bodies, and to the will of men. 2. Stoical fate, defined by Cicero an order or series of causes, wherein cause being linked to cause, each produces another, and thus all things flow from one prime cause. To this fate the Stoics subject even the gods.

FA'TED. *a.* (from fate.) 1. Decreed by fate (*Dryden*). 2. Modelled in any matter by fate (*Prior*). 3. Endued with any quality by fate (*Dryden*).

FATES, in mythology. See PARCÆ.

FATHEMITES, or FATEMITES, the descendants of Mahomet by Fathema or Fatema his daughter.

FA'THER. *s.* (ꝼaðeꞃ, Saxon.) 1. He by whom the son or daughter is begotten (*Bacon*). 2. The first ancestor (*Romans*). 3. The appellation of an old man (*Camden*). 4. The title of any man reverend for age, learning, and piety (*Shakspeare*). 3. One who has given original to any thing good or bad (*Genesis*). 6. The ecclesiastical writers of the first six or eight centuries (*Stillingfleet*). 7. One who acts with paternal care and tenderness (*Job*). 8. The title of a popish confessor (*Addison*). 9. The title of a senator of old Rome (*Dryden*). 10. The appellation of the first person of the adorable Trinity (*Taylor*). 11. The compellation of God as Creator (*C. Prayer*). 12. A title given to prelates, and other church dignitaries.

Father-in-law. *s.* (from *father.*) The father of one's husband or wife (*Addison*).

Father (Natural), he who has illegitimate children.

Father (Adoptive), he who takes the children of some other, and acknowledges them as his own.

Father (Putative), the reputed or supposed father.

Father-lasher, in ichthyology. See **Cottus**

Father-long-legs, in entomology. See **Tipula.**

To **Fa'ther.** *v. a.* 1. To take; to adopt as a son or daughter (*Shakspeare*). 2. To supply with a father (*Shakspeare*). 3. To adopt a composition (*Swift*). 4. To ascribe to any one as his offspring, or production (*Hooker*).

FA'THERHOOD. *s.* (from *father.*) The character or authority of a father (*Hall*).

FA'THERLESS. *a.* (from *father.*) Wanting a father; destitute of a father (*Addison*).

FA'THERLINESS. *s.* (from *father.*) The tenderness of a father; parental kindness.

FA'THERLY. *a.* (from *father.*) Paternal; like a father; tender; protecting (*Shakspeare*).

Fa'therly. *ad.* In the manner of a father (*Milton*).

FA'THOM. *s.* (ꝼæðm, Saxon.) 1. A measure of length containing six feet; the space to which a man can extend both arms (*Holder*). 2. Reach; penetration; depth of contrivance; compass of thought (*Shakspeare*).

To **Fa'thom.** *v. a.* (from the noun.) 1. To encompass with the arms extended or encircling. 2. To reach; to master (*Dryden*). 3. To sound; to try with respect to the depth (*Felton*). 4. To penetrate into; to find the bottom: as, *I cannot* fathom *his design.*

FA'THOMLESS. *a.* (from *fathom.*) 1. That of which no bottom can be found. 2. That of which the circumference cannot be embraced (*Shakspeare*).

FATI'DICAL. *a.* (*fatidicus*, Latin.) Prophetic; having the power to foretel (*Howel*).

FA'TIFEROUS. *a.* (*fatifer*, Lat.) Deadly; mortal; destructive.

FA'TIGABLE. *a.* (*fatigo*, Latin.) Easily wearied; susceptible of weariness.

To **FA'TIGATE.** *v. a.* (*fatigo*, Latin.) To weary; to fatigue: not in use (*Shakspeare*).

FATI'GUE. *s.* (*fatigue*, Fr.) 1. Weariness; lassitude. 2. The cause of weariness; labour; toil (*Dryden*).

To **Fati'gue.** *v. a.* (*fatiguer*, French.) To tire; to weary; to harass with toil (*Prior*).

FATKI'DNEYED. *a.* (*fat* and *kidney.*) Fat: by way of reproach or contempt (*Shakspeare*).

FA'TLING. *s.* (from *fat.*) A young animal fed fat for the slaughter (*Isaiah*).

FA'TNER. *s.* (from *fat.*) That which gives fatness (*Arbuthnot*).

FA'TNESS. *s.* (from *fat.*) 1. The quality of being fat or plump. 2. Fat; grease; fulness of flesh (*Spenser*). 3. Unctuous or greasy matter (*Bacon*). 4. Oleaginousness; sliminess (*Arbuthnot*). 5. Fertility; fruitfulness (*Gen.*). 6. That which causes fertility (*Philips*).

To **FA'TTEN.** *v. a.* (from *fat.*) 1. To feed up; to make fleshy (*Arbuthnot*). 2. To make fruitful (*Dryden*). 3. To feed grossly; to increase (*Dryden*).

To **Fa'tten.** *v. n.* (from *fat.*) To grow fat; to be pampered (*Otway*).

FA'TTY. *a.* (from *fat.*) Unctuous; oleaginous; greasy (*Bacon*).

FATUARII, in antiquity, persons who appeared inspired, and foretold things to come.

FATUITAS. (*fatuitas*; from *fatuus*, silly.) Foolishness. A synonym of amentia.

FATU'ITY. *s.* (*fatuité*, Fr.) Foolishness; weakness of mind (*K. Charles*).

FA'TUOUS. *a.* (*fatuus*, Lat.) 1. Stupid; foolish; feeble of mind (*Glanville*). 2. Impotent; without force (*Denham*).

FA'TWITTED. *a.* (*fat* and *wit.*) Heavy; dull; stupid (*Shakspeare*).

FAUCES. (*faux*, *fauces.*) A cavity behind the tongue, palatine arch, uvula, and tonsils: from which the pharynx and larynx proceed.

FA'UCET. *s.* (*fausset*, French.) The pipe inserted into a vessel to give vent to the liquor, and stopped up by a peg or spigot (*Swift*).

FAUCHEUR (Michel le), a French protestant divine, greatly admired for his eloquence. The marquis de la Force said, after hearing him preach against duelling, "If a challenge were to be sent to me, I would refuse it." He died at Paris in 1667. His works are; 1. A Treatise on oratorical Action. 2. Sermons, in 8vo. 3. Christian Prayers and Meditations. 4. A Treatise on the Eucharist, against cardinal Perron.

FAUCHION. (See **Falchion.**) A crooked sword.

FAUCON, or **Falcon**, a name formerly given to a small piece of cannon, whose diameter was 2¼ inches; weight 750 pounds; length 7 feet; load 2¼ pound; shot 2½ inches diameter, and 2½ pound weight. See **Cannon.**

FAUCONET, or **Falconet**, a very small piece of ordnance, whose diameter at the bore was 2¼ inches; weight 400 pounds; length 6 feet; load 1¼ pound; shot something more than two inches diameter, and 1½ pound weight.

FA'UFEL. *s.* (French.) The fruit of a species of the palm-tree.

FAVI'LLOUS. *a.* (*favilla*, Latin.) Consisting of ashes (*Brown*).

FAVISSÆ, in antiquity, 1. Cisterns to keep water in. 2. Subterraneous reservoirs in which were laid old statues, and other things formerly used in the temple.

FA'ULCON. *s.* See **Falcon.**

FAULT. *s.* (*faute*, French.) 1. Offence; slight crime; somewhat liable to censure or objection (*Hooker*). 2. Defect; want; absence (*Shakspeare*). 3. Puzzle; difficulty.

To **Fault.** *v. n.* (from the noun.) To be wrong; to fail (*Spenser*).

To **Fault.** *v. a.* To charge with a fault; to accuse.

FA'ULTER. *s.* (from *fault.*) An offender, one who commits a fault (*Fairfax*).

FA'ULTFINDER. *s.* (*fault* and *find.*) A censurer; an objector.

FA'ULTILY. *ad.* (from *faulty.*) Not rightly; improperly; defectively; erroneously.

FA'ULTINESS. *s.* (from *faulty.*) 1 Badness; vitiousness (*Sidney*). 2. Delinquency; actual offences (*Hooker*).

FA'ULTLESS. *a.* (from *fault.*) Exempt from fault; perfect (*Fairfax*).

FA'ULTY. *a.* (*fautif*, French.) 1. Guilty of a fault; blameable; criminal; not innocent (*Milton*). 2. Wrong; erroneous (*Hooker*). 3. Defective; bad in any respect (*Bacon*).

FAUNALIA, in antiquity, Roman feasts celebrated in honour of the god Faunus, who was the same among the Romans with the Pan of the Greeks. The Faunalia were held on the day of the nones of December; i. e. on the fifth day of that month. The principal sacrifice was a roe-buck, or rather, according to Horace, a kid, attended with libations of wine and burning of incense. See Ode 18. lib. iii.

FAUNS, Fauni, among the ancients, were a species of demi-gods inhabiting the forests; called also Sylvans (*Sylvani*), and little differing from the Satyrs. They delighted more particularly in vineyards; and they generally appear as attendants of Bacchus, in the representations of Bacchanal feasts and processions. They were represented as half men, half goats, having the horns, ears, feet, and tail of a goat, a very flat nose, and the rest human. Though the Fauns were held as demi-gods, yet they were supposed to die after a long life. Arnobius shows that their father or chief, Faunus himself, only lived 120 years.

FAUNUS, in fabulous history, a son of Picus, who reigned in Italy about 1300 years before the Augustan age. His bravery, as well as wisdom, have given rise to the tradition that he was the son of Mars. His great popularity, and his fondness for agriculture, made his subjects revere him as one of their country deities after death. He was represented with all the equipage of the satyrs, and was consulted to give oracles.

FAVONIUS, among the Romans, the wind which blew directly from the west.

FAVORITO, an epithet given to such parts of a musical composition as are performed to the greatest advantage, by the best voices or instruments.

To **FA'VOUR.** *v. a.* (*faveo*, Latin.) 1. To support; to regard with kindness; to countenance (*Bacon*). 2 To assist with advantages or conveniencies (*Addison*). 3. To resemble in feature (*Spectator*). 4. To conduce to; to contribute.

Fa'vour. *s.* (*favor*, Latin.) 1. Kindness; kind regard (*Shakspeare*). 2. Support; defence; vindication (*Rogers*). 3. Kindness granted (*Sidney*). 4. Lenity; mildness; mitigation of punishment (*Swift*). 5. Leave; good-will; pardon (*Psalms*). 6. Object of favour (*Milton*). 7. Something given by a lady to be worn (*Shakspeare*). 8. Any thing worn openly as a token (*Shakspeare*). 9 Feature; countenance (*South*).

FA'VOURABLE. *a.* (*favourable*, French.) 1. Kind; propitious; affectionate (*Shaksp.*). 2. Palliative; tender; averse from censure. 3. Conducive to; contributing to (*Temple*). 4. Accommodate; convenient (*Clarendon*). 5. Beautiful; well-favoured: obsolete (*Spenser*).

FA'VOURABLENESS: *s.* (from *favourable.*) Kindness; benignity.

FA'VOURABLY. *ad.* (from *favourable.*) Kindly; with favour (*Rogers*).

FA'VOURED. *particip. a.* 1. Regarded with kindness (*Pope*). 2. Featured. With *well* or *ill* (*Spenser*).

FA'VOUREDLY. *ad.* With *well* or *ill.* In a fair or foul manner.

FA'VOURER. *s.* (from *favour.*) One who favours; one who regards with kindness or tenderness; a wellwisher; a friend (*Daniel*).

FA'VOURITE. *s.* (*favorite*, French.) 1. A person or thing beloved; one regarded with favour (*Pope*). 2 One chosen as a companion by his superior (*Clarendon*).

FA'VOURLESS. *a.* (from *favour.*) 1. Unfavoured; not regarded with kindness. 2. Unfavouring; unpropitious (*Spenser*).

FA'VOUS RECEPTACLE, in botany, a honey-combed receptacle. See Alveolate.

FAUQUEMONT, or Valkenburg, a town of the Dutch Netherlands, seven miles E. of Maestricht. Lat. 50. 52 N. Lon. 5. 50 E.

FAUSEL-NUT, in botany. See Areca.

FA'USEN. *s.* A large sort of eel (*Chapman*).

FA'USSEBRAYE. *s.* A small mount of earth, four fathom wide, erected on the level round the foot of the rampart (*Harris*).

FA'UTOR. *s.* (Latin; *fauteur*, French.) Favourer; countenancer (*Ben Jonson*).

FA'UTRESS. *s.* (*fautrice*, Fr.) A woman that favours, or countenances (*Chapman*).

FAUX, in botany, the jaws, chaps, throat, or opening of the tube of the corol; or, between the segments of the corol, where the tube ends. As in the class didynamia and the asperifoliæ in class pentandria. Hiatus inter lacinias corollæ ubi tubus terminatur. The whole upper part of the tube is called the neck, *collum*: and the opening is sometimes termed the mouth, *os*.

FAWKES (Francis), an English poet and divine. He was born in Yorkshire about 1725, and educated at Jesus college, Cambridge, where he took his degrees in arts. On entering into orders he settled at Bromham in his native county, but afterwards he obtained the vicarage of Orpington in Kent, which he exchanged in 1774 for the rectory of Hayes. He died in 1777. Mr. Fawkes is known by many ingenious poems of his own, but more so by his translations of Anacreon, Sappho, Bion, and Moschus, published in 1760 in 12mo. and the Idylliums of Theocritus, 1767, 8vo.

FAWN. The young of the buck and doe, so called during its first year. The fawn is secreted by the dam in fern, or long grass, with great care, during the first weeks, and seldom accompanies the mother but by night. In royal parks and chaces, a certain number are annually killed when about three months old, to prevent the district from being overstocked; this is generally done by coursing with grey-hounds, which is often accounted excellent sport, the greyhounds being frequently beaten.

To **Fawn.** *v. n.* (of uncertain original.) 1. To court by frisking before one, as a dog (*Sidney*). 2. To court by any means (*South*). 3. To court servilely (*Milton*).

Fawn. *s.* A servile cringe; low flattery (*Shakspeare*).

FA'WNER. *s.* (from *fawn.*) One that fawns; one that pays servile courtship (*Spectator*).

FA'WNINGLY. *ad.* (from *fawn.*) In a cringing servile way.

FA'XED. *a.* (from ꝼæx, Saxon.) Hairy (*Camden*).

FAY. *s.* (*fée*, French.) 1. A fairy; an elf (*Milton*). 2. (*foi*, French.) Faith: obsolete (*Spenser*).

FAYAL, one of the Azores, or Western Islands, which suffered greatly by an earthquake in 1764. Its capital is Villa do Horta.

FAYETTE, a county of Kentucky, bounded on the N. by the Ohio, on the E. by Bourbon county, and on the S.W. by the river Kentucky. Lexington is the capital.

Fayette, a county of Pennsylvania, 37 miles long, and 33 broad. In 1790, it contained 13,325 inhabitants. Union is the capital.

FAYETTEVILLE, a town of N. Carolina, on the N.W. branch of Cape Fear river, 90 miles N.W. of Wilmington, to which that river is navigable for boats.

FE, **Fo**, or **Fohi**, the name of the chief god of the Chinese, whom they adore as the sovereign of heaven. They represent him shining all in light, with his hands hid under his robes, to show that his power does all things invisibly.

Fe (Santa), a rich and regular built city, the capital of New Mexico, and the see of a bishop. It is situate near the source of the Rio del Nort. Lat. 36. 50. N. Lon 108. 48 W.

Fe (Santa), a town of Paraguay, situate at the confluence of the Salade with the Plata, 450 miles S.W. of Assumption. Lat 30. 45 S. Lon 60. 40 W.

FEABERRY. *s.* A gooseberry.

FEAL, was anciently used for faithful. It is now a provincial term for turf.

Feal-dikes, cheap fencing used in Scotland, by means of the turf dug from the surface of ditches.

FEALTY, in law, an oath taken, on the admittance of any tenant, to be true to the lord of whom he holds his land; by this oath the tenant holds in the freest manner, on account that all who have fee hold per fidem et fiduciam, that is, by fealty at the least. This fealty, at the first creation of it, bound the tenant to fidelity, the breach of which was the loss of his fee. It has been divided into general and special; general, that which is to be performed by every subject to his prince; and special, required only of such as, in respect of their fee, are tied by oath to their lords. To all manner of tenures, except tenantcy at will and frankalmoign, fealty is incident, though it chiefly belongs to copyhold estates, held in fee and for life. The form of this oath by stat. 17 Ed. II. is to run as follows: "I A. B. will be to you my lord D. true and faithful, and bear to you faith for the lands and tenements which I hold of you, and I will truly do and perform the customs and services that I ought to do to you. So help me God."

Fealty, is sometimes used to denote fidelity to a master.

FEAR. *s.* (ꝼeaꞃan, Saxon.) 1. Dread; terrour; painful apprehension of danger (*Locke*). 2. Awe; dejection of mind at the presence of any person or thing (*Genesis*). 3. Anxiety; solicitude (*Maccabees*). 4 That which causes fear (*Shakspeare*). 5. The object of fear (*Genesis*). 6. Something hung up to scare deer (*Isaiah*).

Fear, when considered philosophically, may be described as a painful sensation produced by the immediate apprehension of some impending evil. This evil may consist in being deprived of what we at present enjoy, in being disappointed in what we expect, or in the infliction of a positive misery.

The passion of fear is still more painful than that of sorrow, which, notwithstanding its severity, has, when calmed into an affection, something soothing in its nature. Fear produces an agony and anxiety about the heart not to be described; and it may be said to paralyze the soul in such a manner, that it becomes insensible to every thing but to its own misery. Inertness and torpor pervade the whole system, united with a constriction of the integuments of the body, and also a certain sense of being fettered, or of being rendered incapable of motion. The eyes are pallid, wild, and sunk in their sockets; the countenance is contracted and wan; the hair stands erect, or at least excites the sensation, which every child experiences as often as he is terrified by stories of ghosts, witches, &c.; the bowels are strongly affected, the heart palpitates, respiration labours, the lips tremble, the tongue falters, the limbs are unable to obey the will, or support the frame. Dreadful shrieks denote the inward anguish: these are often succeeded by syncopies; which, while they manifest that the sufferings are greater than nature can sustain, afford a temporary relief.

Such are the external signs which indicate the wretched state of mind under this horrid passion. Since torpor, debility, and painful constrictions frequently accompany fear more than any other passion, the emotions will, in such instances, be less vivid. Instead of violent transports, a deep depression and numbness, as it were, both of body and mind, characterise the passion; though these may be visible to the spectators, and are not less expressive of inward anguish.

When the effects of fear operate powerfully, without any mixture of hope, these passive impressions are predominant: but where there is a possibility of escape, the mind reacts with wonderful energy. Abject depression is changed into violent agitations; collected force takes place of debility; and tremendous exertions succeed to the torpid and inert state. When a personal attack is apprehended, momentary and trembling strength is thrown into the muscles; the body instinctively places itself in the attitude of defence; a mixture of fierceness and wild horror is expressed in the countenance, well adapted to alarm and terrify the enemy. If escape be attempted, an unusual energy is thrown into the limbs, enabling the sufferer to precipitate his flight, by exertions that would have been impracticable, in a more composed state of mind. (*Cogan on the Passions*).

Fear. *s.* (ꝼeoꞃa, Saxon.) A companion: obsolete (*Spenser*).

To **Fear.** *v. a.* (ꝼeaꞃan, Saxon.) 1. To dread; to consider with apprehensions of terrour; to be afraid of (*Dryden*). 2. To fright; to make afraid (*Donne*).

To **Fear.** *v. n.* 1. To live in terrour; to be afraid (*Shakspeare*). 2. To be anxious (*Dryden*).

FE'ARFUL. *a.* (*fear* and *full.*) 1. Timorous; easily made afraid (*Shakspeare*). 2. Afraid (*Davies*). 3. Awful; to be reverenced (*Exodus*). 4. Terrible; dreadful; frightful (*Tillotson*).

FE'ARFULLY. *ad.* (from *fearful.*) 1. Timorously, in fear (*Shakspeare*). 2. Terribly; dreadfully (*Shakspeare*).

FE'ARFULNESS. *s.* (from *fearful.*) 1. Timorousness; habitual timidity. 2. State of being afraid; awe; dread (*South*).

FE'ARLESLY. *ad.* (from *fearless.*) Without terrour; intrepidly (*Decay of Piety*).

FE'ARLESNESS. *s.* (from *fearless.*) Exemption from fear; intrepidity (*Clarendon*).

FE'ARLESS. *a.* (from *fear.*) Free from fear; intrepid; courageous; bold (*Temple*).

FEASIBI'LITY. *s.* (from *feasible.*) 1. Practicability. 2. A thing practicable (*Brown*).

FE'ASIBLE. *a.* (*faisible*, French.) Practicable; that may be effected or done (*Glanville*).

FE'ASIBLY. *ad.* (from *feasible.*) Practicably.

FEAST. *s.* (*feste*, French, or *festum*, Lat.) 1. An entertainment of the table; a sumptuous treat of great numbers (*Genesis*). 2. An anniversary day of rejoicing (*Shakspeare*). 3. Something delicious to the palate (*Locke*).

Feasting seems to have been the chief delight of the Germans, Gauls, Britons, and all the other Celtic nations; in which they indulged themselves to the utmost, as often as they had an opportunity. Among these nations (says an author who had carefully studied their manners) there is no public assembly, either for civil or religious purposes, duly held; no birthday, marriage, or funeral properly celebrated; no treaty of peace or alliance rightly cemented, without a great feast. It was by frequent entertainments of this kind that the great men or chieftains gained the affections and rewarded the services of their followers; and those who made the greatest feasts were sure to be most popular, and to have the greatest retinue. These feasts (in which plenty was more regarded than elegance) lasted commonly several days, and the guests seldom retired until they had consumed all the provisions and exhausted all the liquors.

It has been often observed by authors, that there is no nation in the world comes near the English in the magnificence of their feasts. Those made at our coronations, installments, consecrations, &c. transcend the belief of all foreigners; and yet it is doubted whether those now in use are comparable to those of our forefathers.

Feasts (Religious), and the ceremonies thereof, have been observed amongst almost all nations and sects; witness the Greeks, Romans, Hebrews, Christian and Mahometans.

Feasts among us are either immoveable or moveable. Immoveable feasts are those constantly celebrated on the same day of the year; the principal of these are Christmas-day or the Nativity, the Circumcision, Epiphany, Candlemas or the Purification; Lady-day or the Annunciation, called also the Incarnation and Conception; All Saints, and All Souls; besides the days of the several apostles, St. Thomas, St. Paul, &c. Moveable feasts are those which are not confined to the same day of the year. Of these the principal is Easter, which gives law to all the rest, all of them following, and keeping their proper distances from it; such are Palm-Sunday, Good-Friday, Ash-Wednesday, &c. The four feasts which the English laws take especial notice of are, the Annunciation of the blessed Virgin Mary, or Lady-day, the 25th of March; the nativity of St. John the Baptist, held on the 24th of June; the Feast of St. Michael the Archangel, on the 29th of September; and that of St. Thomas the Apostle, on the 21st of December; on which quarterly days rent on leases is usually reserved to be paid.

Beside these feasts which are general, and enjoined by the church, there are others local and occasional, enjoined by the magistrate, or voluntarily set on foot by the people; such are the days of thanksgiving for delivery from wars, plagues, &c. Such also are the vigils or wakes in commemoration of the dedications of particular churches. The prodigious increase of feast-days in the Christian church commenced towards the close of the fourth century, and was occasioned by the discovery that was then made of the remains of martyrs and other holy men, for the commemoration of whom they were established. These, instead of being set apart for pious exercises, were abused in indolence, voluptuousness, and criminal practices. Many of them were instituted on a pagan model, and perverted to similar purposes.

Feast of death, or **Feast of souls**, a solemn religious ceremony in use among the savages of America; some of whom thus testify their respect for the deceased every eight years; and others, as the Hurons and Iroquois, every ten years.

The day of this ceremony is appointed by public order; and nothing is omitted, that it may be celebrated with the utmost pomp and magnificence. The neighbouring tribes are invited to be present, and to join in the solemnity. At this time all who have died since the last solemn occasion are taken out of their graves: those who have been interred at the greatest distance from the villages are diligently sought for, and brought to this great rendezvous of carcases. The savages take the bodies into their respective cottages, where they prepare feasts in honour of them, and present them offerings. The custom is supposed to have arisen from a rude notion of the immortality of the soul.

To **Feast.** *v. n.* To eat sumptuously (*Shak.*).

To **Feast.** *v. a.* 1. To entertain sumptuously (*Hayward*). 2. To delight; to pamper (*Dryden*).

FE'ASTER. *s.* (from *feast.*) One that fares deliciously (*Taylor*). 2. One that entertains magnificently.

FE'ASTFUL. *a.* (*feast* and *full.*) 1. Festive; joyful (*Milton*). 2. Luxurious; riotous (*Pope*).

FE'ASTRITE. *s.* (*feast* and *rite.*) Custom observed in entertainments (*Philips*).

FEAT. *s.* (*fait*, French.) 1. Act; deed; action; exploit (*Spenser*). 2. A trick; a ludicrous performance (*Bacon*).

Feat. *a.* (*fait*, French.) 1. Ready; skilful; ingenious (*Shakspeare*). 2. Nice; neat (*Shakspeare*).

FE'ATEOUS. *a.* Neat; dexterous: obsolete.

FE'ATEOUSLY. *ad.* Neatly; dexterously (*Spenser*).

FE'ATHER. *s.* (ꝼeðeꞃ, Saxon.) 1. The plume of birds (*Newton*). 2. Kind; nature; species (*Shakspeare*). 3. An ornament; an empty title.

Feather, in physiology, a general name for the covering of birds: it being common to all the animals of this class to have their whole body, or at least the greatest part of it, covered with feathers or plumage.

There are two sorts of feathers belonging to birds, viz. the strong and hard kind, called quills, found in the wings and tail; and the other plumage, or soft feathers, serving for the defence and ornament of the whole body. All birds, so far as yet known, moult the feathers of their whole body yearly. Feathers make a considerable article of commerce, particularly those of the ostrich, heron, swan, peacock, goose, &c. for plumes, ornaments of the head, filling of beds, writing-pens, &c. Geese are plucked in some parts of Great Britain, five times in the year; and in cold seasons many of them die by this barbarous custom. Those feathers that are brought from Somersetshire are esteemed the best, and those from Ireland the worst.

Eider down is imported from Denmark; the ducks that supply it being inhabitants of Hudson's-bay, Greenland, Iceland, and Norway. All the islands west of Scotland breed numbers of these birds, which turn out a profitable branch of trade to the poor inhabitants. Hudson's-bay also furnishes very fine feathers, supposed to be of the goose kind. The down of the swan is brought from Dantzic. The same place also sends us great quantities of the feathers of the cock and hen. The London poulterers sell a great quantity of the feathers of those birds, and of ducks and turkeys; those of ducks being a weaker feather, are inferior to those of the goose; and turkeys feathers are the worst of any. The best method of curing feathers is to lay them in a room, exposed to the air and sun; and when dried, to put them in bags, and beat them well with poles to get off the dirt.

By chemical analysis, feathers appear to consist of little more than inspissated albumen, mixed with a very minute portion of gelatin; so minute, however, that quill or feather, freed from adhering oil, may be boiled for many days in water without any apparent alteration, the liquor having no sensitive properties, giving no precipitate with tar, and a very small one with nitro-muriat of tin. In its general properties, therefore, feather resembles hair, nail, cuticle, and cuticular shell. Like these substances also, feathers, according to Delaval, owe their colour to thin layers of coloured matter, covering the white substance of which they are principally formed. He scraped off the superficial colour from such parts of vividly coloured feathers as were solid enough to admit of that operation, and by this means separated the coloured layers from the white ground on which they had been naturally spread. The surfaces of the lateral fibres of feathers cannot be thus separated on account of their minuteness. But as they appear, when viewed with a microscope, nearly to resemble in their form the feathers themselves, it seems probable that their colours arise from a similar matter, and conformation in the smaller fibres, as in the grosser parts of the feathers.

Feather, in the manage, a sort of natural frizzling of the hair, found in many parts of the horse's body, but more commonly between the eyes. Many are of opinion, that, when the feather is lower than the eyes, it is a sign of a weak eye-sight; but this is mere conjecture. A Roman feather, or the French epée Romain, is situated upon a horse's neck; being a row of hair turned back and raised, forming a mark like a feather or sword-blade along the mane.

Feather (Princes), in botany. See **Amaranthus.**

To **Fe'ather.** *v. a.* (from the noun.) 1. To dress in feathers. 2. To fit with feathers. 3. To tread as a cock (*Dryden*). 4. To enrich; to adorn; to exalt (*Bacon*). 5. *To* **Feather** *one's nest.* To get riches together.

FE'ATHERBED. *s.* (*feather* and *bed.*) A bed stuffed with feathers (*Donne*).

FE'ATHERDRIVER. *s.* (*feather* and *drive.*) One that cleanses feathers (*Derham*).

FE'ATHERED. *a.* (from *feather.*) 1. Clothed with feathers (*Dryden*). 2. Fitted with feathers; carrying feathers.

Feathered columbine, in botany. See Thalictrum.

FE'ATHEREDGE. *s.* Boards or planks that have one edge thinner than another, are called *featheredge* stuff (*Moxon*).

FE'ATHEREDGED. *a.* (*feather* and *edge.*) Belonging to a featheredge (*Mortimer*).

FE'ATHERFEW. *s.* A plant.

FE'ATHERLESS. *a.* (from *feather.*) Being without feather (*Howel*).

FE'ATHERLY. *a.* (from *feather.*) Resembling feathers (*Brown*).

FE'ATHERSELLER. *s.* (*feather* and *seller.*) One who sells feathers for beds.

Feather weight, in the sporting vocabulary, signifies the lightest weight that can be put upon the back of a horse, in whatever match he may be engaged, and totally depends upon the will of the owner; who is not under the necessity of bringing his rider to the scale either before or after the race, in an engagement where feather weight is particularly expressed. On the contrary, when a horse runs for any plate, match, sweepstakes, or subscription, at a fixed weight, according to his age, height, or qualification, his rider must be publicly weighed upon the course previous to starting; and at the termination of every heat, if the rider dismount before his horse is led up to the scales (generally affixed to the starting-post,) or when there, if he do not weigh his proper weight, the horse is deemed distanced, and can start no more for the prize in question.

FE'ATHERY. *a.* (from *feather.*) Clothed with feathers (*Milton*).

FE'ATLY. *ad.* (from *feat.*) Neatly; nimbly; dexterously (*Dryden*).

FE'ATNESS. *s.* (from *feat.*) Neatness; nicety; dexterity.

FE'ATURE. *s.* (*faiture*, old French.) 1. The cast or make of the face (*Shakspeare*). 2. Any lineament or single part of the face.

To Fe'ature. *v. a.* To resemble in countenance; to favour (*Shakspeare*).

To FEAZE. *v. a.* (*fqisez*, French.) 1. To untwist the end of a rope, and reduce it again to its first stamina. 2. To beat; to whip with rods (*Ainsworth*).

FEBRES. (*febris.*) An order in the class pyrexiæ of Cullen, characterized by the presence of pyrexia, without primary or local affection.

FEBRI'CITATE. *v. a.* (*febricitor*, Latin.) To be in a fever.

FEBRICULA. (*febricula*, of *febris*, a fever.) A term employed to express a slight degree of symptomatic fever.

FEBRI'CULOSE. *a.* (*febriculosus*, Latin.) Troubled with a fever.

FEBRIFU'GE. *a.* Having the power to cure fevers (*Arbuthnot*).

Febrifu'ge. (*febrifuga*, from *febris*, a fever, and *fugo*, to drive away.) A medicine that possesses the property of abating the violence of any fever.

FEBRIS. A fever. Of this there are various genera. The following are the chief: They all belong to the class pyrexiæ and order phlegmasia of Cullen.

F. continua. A continued fever. It has no intermission, but exacerbations come on twice in one day. The species of continued fever are three: 1. *Synocha*, or inflammatory fever, known by increased heat; pulse frequent, strong, and hard; urine high-coloured; senses not much impaired. 2. *Typhus*, or putrid-tending fever, which is contagious, and is characterized by moderate heat; quick, weak, and small pulse; senses much impaired, and great prostration of strength. Typhus has four varieties, viz.

α *Typhus petechialis*, typhus with petechiæ.
β *Typhus mitior*, the nervous fever.
γ *Typhus gravior*, the putrid fever.
δ *Typhus icterodes*, the yellow fever.

3. *Synochus*. Mixed fever; being a compound of the two preceding, commencing like the first, and terminating with the symptoms of the second.

F. erysipelatosa. Erysipelatous fever; St. Anthony's Fire. See Erysipelas.

F. hectica. Hectic fever. It is known by exacerbations at noon, but chiefly in the evening, with slight remissions in the morning, after nocturnal sweats; the urine depositing a furfuraceo-lateritious sediment; appetite good; thirst moderate. Hectic fever is symptomatic of chlorosis, scrofula, phthisis, diseased viscera, &c.

F. inflammatoria. See Febris continua.

F. intermittens. Intermittent fever or ague. It is known by cold, hot, and sweating stages in succession, attending each paroxysm, and followed by an intermission or remission. There are three species of this disease, viz. 1. *Intermittens quotidiana*. A quotidian ague. The paroxysms return in the morning at an interval of about twenty-four hours. 2. *Intermittens tertiana*. A tertian ague. The paroxysms commonly come on at mid-day, at an interval of about forty-eight hours. 3. *Intermittens quartana*. A quartan ague. The paroxysms come on in the afternoon, with an interval of about seventy-two hours.

F. nervosa. Febris lenta nervosa. Nervous fever. A variety of typhus mitior of Cullen, but by many considered as a distinct disease. It mostly begins with loss of appetite, increased heat and vertigo; to which succeed nausea, vomiting, great languor, and pain in the head, which is variously described, by some like cold water pouring over the top, by others a sense of weight. The pulse, before little increased, now becomes quick, feeble, and tremulous; the tongue is covered with a white crust, and there is great anxiety about the præcordia. Towards the seventh or eighth day, the vertigo is increased, and tinnitus aurium, cophosis, delirium, and a dry tremulous tongue, take place. The disease mostly terminates about the fourteenth or twentieth day.

F. putrida. See FEBRIS CONTINUE.

F. vesiculosa. Bladdery fever. See ERYSIPELAS and PEMPHIGUS.

FE'BRILE. *a.* (*febrilis*, Latin.) Constituting a fever; caused by a fever (*Harvey*).

FEBRUA, in antiquity, a feast held by the Romans in the month of February, in behalf of the manes of the deceased.

FEBRUARY, the second month of the year, containing 28 days for three years, and every fourth year 29 days. The name is derived either from the god Februus, or from Juno, surnamed Februa.

FECAMP, an ancient seaport of France, in the department of Lower Seine. It had lately a famous Benedictine abbey. Lat. 49. 37 N. Lon. 0. 23 E.

FECES. See FÆCES.

The human fæces, according to the experiments of Berzelius, were found to contain

Water	73·3
Vegetable and animal remains	7·0
Bile	0·9
Albumen	0·9
Peculiar extractive matter	2·7
Salts	1·2
Slimy matter, consisting of resin of bile, peculiar animal matter, and insoluble residue	14·0
	100·0

FECIALES, or FŒCIALES, an order of priests or officers, consisting of twenty persons, among the ancient Romans, appointed to proclaim war, negociate peace, &c.

FECULA. See FÆCULA.

FE'CULENCE, FE'CULENCY. *s.* (*fæculentia*, Latin.) 1. Muddiness; quality of abounding with lees or sediment. 2. Lees; fæces; sediment; dregs (*Boyle*).

FE'CULENT. *a.* (*fæculentus*, Latin.) Foul; dreggy; excrementitious (*Glanville*).

FECU'ND. *a.* (*fœcundus*, Latin.) Fruitful; prolifick (*Graunt*).

FECUNDA'TION. *s.* (*fœcundo*, Latin.) The act of making prolifick (*Brown*).

To FECU'NDIFY. *v. a.* To make fruitful.

FECU'NDITY. *s.* (*fecondité*, French.) 1. Fruitfulness; quality of producing or bringing forth in great abundance (*Woodward*). 2. Power of producing or bringing forth (*Ray*).

FED. The preterit and participle pass. of *feed*.

FE'DARY. *s.* A confederate, a partner, or a dependant (*Shakspeare*).

FE'DERAL. *a.* (from *fœdus*, Latin.) Relating to a league or contract (*Hammond*).

FE'DERARY. *s.* (from *fœdus*, Latin.) A confederate; an accomplice (*Shakspeare*).

FE'DERATE. *a.* (*fœderatus*, Latin.) Leagued.

FEE. *s.* (feoh, Saxon.) 1. All lands and tenements that are held by any acknowledgment of superiority to a higher lord (*Cowell*). 2. Property; peculiar (*Shakspeare*). 3. Reward; gratification; recompense (*Shakspeare*). 4. Payments occasionally claimed by persons in office (*Shakspeare*). 5. Reward paid to physicians or lawyers (*Addison*).

FEE, FEUD, FEUDUM, FEODUM, or FIEF, an estate, land, tenement, lordship, or the like, held of a superior lord, on condition of fealty, homage, or other acknowledgment.

The word is derived by some authors from *fœdus*, as arising from a treaty or alliance made with the lord; but the opinion of Selden seems the best authorised, who brings it from the Saxon, *feoh*, stipendium.

The term fee is properly applied to lands and tenements, which we hold in perpetual right, on condition of an acknowledgment of superiority in a higher lord. See TENURE.

The writers on this subject divide all lands and tenements wherein a man has a perpetual estate to him and his heirs into allodium and feudum.

Allodium is defined to be a man's own land, which he possesses merely in his own right, without acknowledgment of any service or payment of any rent to another; and this is property in the highest degree.

Feudum is that which we hold by the benefit of another, and for which we do service or pay rent, or both, to the chief lord.

All our land here in England (the crown-lands being in the king's own hands, in right of his crown, excepted) is in the nature of feudum or fee; for though many have land by descent from their ancestors, and others have clearly purchased land with their money, yet is the land of such a nature, that it cannot come to any, either by descent or purchase, but with the burthen that was laid upon him who had novel fee, or first of all received it as a benefit from his lord to him, and to all such to whom it might descend, or any way be conveyed from him; so that in truth, no man has directum dominium, the very property or demesne, in any land, but only the prince in right of his crown. Cam. Brit. 93. See FEODAL SYSTEM.

FEE SIMPLE, is an estate of inheritance whereby a person is seised of lands, tenements, or hereditaments, to hold to him and his heirs for ever, generally, absolutely, and entirely, without mentioning what heirs, but referring that to his own pleasure, or the disposition of the law. It is the most perfect tenure of any, when unincumbered; but although the greatest interest which by our law a subject can possess, yet it may be forfeited for treason or felony. To constitute an estate in fee, or of inheritance, the word heir is necessary in the grant or donation. Co. Lit. 1. Plowd. 498. 2 Black. 48.

FEE QUALIFIED, is such a freehold estate, as has a qualification subjoined to it, and which therefore must determine whenever the qualification is at an end. Co. Lit. 27.

FEE CONDITIONAL. This estate was, at

the common law; a fee restrained to some particular heirs, exclusive of others; as to the heirs of a man's body, or to the heirs male of his body: in which cases it was held, that as soon as the grantee had issue born, the estate was thereby converted into fee simple, at least so far as to enable him to sell it, to forfeit it by treason, or to charge it with incumbrances. But the statute de donis having enacted, that such estates so given, to a man and the heirs of his body, should at all events go to the issue, if there were any, or, if none, should revert to the donor, this was by the judges denominated an estate in tail. Plowd. 251. See **Estate.**

Fee-farm, a kind of tenure without homage, fealty, or other service, except that mentioned in the feoffment; which is usually the full rent, or at least a fourth part of it. The nature of this tenure is, that if the rent be behind, and unpaid for two years, then the feoffor and his heirs may have an action for the recovery of the lands.

To **Fee.** *v. a.* (from the noun.) 1. To reward; to pay (*South*). 2. To bribe; to hire (*Shakspeare*). 3. To keep in hire (*Shakspeare*).

FE'EBLE. *a.* (*foible*, French.) Weak; debilitated; sickly; infirm (*Smith*).

To **Fe'eble.** *v. a.* (from the noun.) To weaken; to enfeeble: not in use (*Shakspeare*).

FEEBLEMI'NDED. *a.* (*feeble* and *mind*). Weak of mind (*Thessalonians*).

FE'EBLENESS. *s.* (from *feeble.*) Weakness; imbecility; infirmity (*South*).

FE'EBLY. *ad.* (from *feeble.*) Weakly; without strength (*Drayton*).

To **FEED.** *v. a.* (*fodan*, Goth. ꝼeꝺan, Saxon.) 1. To supply with food (*Arbuthnot*). 2. To supply; to furnish (*Addison*). 3. To graze; to consume by cattle (*Mortimer*). 4. To nourish; to cherish (*Prior*). 5. To keep in hope or expectation (*Knolles*). 6. To delight; to entertain (*Bacon*). 7. To make fat.

To **Feed.** *v. n.* 1. To take food (*Shakspeare*). 2. To prey; to live by eating (*Temple*). 3. To pasture; to place cattle to feed (*Exodus*). 4. To grow fat or plump.

Feed. *s.* (from the verb.) 1. Food; that which is eaten (*Sidney*). 2. Pasture (*Shakspeare*). 3. Meal; act of eating (*Milton*).

FE'EDER. *s.* (from *feed.*) 1. One that gives food (*Denham*). 2. An exciter; an encourager (*Shakspeare*). 3. One that eats (*Brown*).

Feeder, among huntsmen, the person who has the management of the hounds in kennel; and who fills a station subordinate to the huntsman.

He should be young, indefatigable, and alert, fond of his employment, humane and good tempered, as much of the comfort of the animals intrusted to his care depends upon him. It is his particular business to keep the kennel sweet and clean, and to execute this part of his trust at stated and regular periods; to prepare, boil, and mix the different kinds of provision for the hounds, according to the regulations of the establishment to which he belongs. When disengaged from the concerns of the kennel he is expected to assist in the stables; as well as to exercise and dress the spare horses of the huntsman and whipper-in, on hunting days, during their absence.

To **FEEL.** *v. n.* pret. *felt*; part. pass. *felt*. (ꝼelan, Saxon.) 1. To have perception of things by the touch. 2. To search by feeling (*Acts*). 3. To have a quick sensibility of good or evil, right or wrong (*Pope*). 4. To appear to the touch (*Sharp*).

To **Feel.** *v. a.* 1. To perceive by the touch (*Judges*). 2. To try; to sound (*Shakspeare*). 3. To have sense of external pain or pleasure (*Creech*). 4. To be affected by; to perceive mentally. 5. To know; to be acquainted with (*Shakspeare*).

Feel. *s.* (from the verb.) The sense of feeling; the touch (*Sharp*).

FE'ELER. *s.* (from *feel.*) One that feels (*Shakspeare*).

FEELERS, in entomology, organs affixed to the mouth of insects, generally less than the antennas, and often jointed.

FE'ELING. *particip. a.* (from *feel.*) 1. Expressive of great sensibility (*Sidney*). 2. Power of action on sensibility (*Bacon*). 3. Perception; sensibility (*Watts*).

Feeling, one of the five external senses, by which we obtain the ideas of solid, hard, soft, rough, hot, cold, wet, dry, and other tangible qualities. This sense is the coarsest, but, at the same time, the surest of all others; it is, besides, the most universal. We see and hear with small portions of our body, but we feel with all. The God of nature has bestowed that general sensation wherever there are nerves, and they are every where, where there is life. Were it otherwise, the parts divested of it might be destroyed without our knowledge. It seems that upon this account, the Deity has provided that this sensation should not require a particular organization. The structure of the nervous papillæ is not absolutely necessary to it. The lips of a fresh wound, the periosteum, and the tendons, when uncovered, are extremely sensible without them. These nervous extremities serve only to the perfection of feeling, and to diversify sensation. Feeling is the basis of all other sensations.

FE'ELINGLY. *ad.* (from *feeling.*) 1. With expression of great sensibility (*Sidney*). 2. So as to be sensibly felt (*Raleigh*).

FEET. *s.* The plural of foot.

Feet-bearer, the name of an officer in the courts of the ancient Anglo-Saxon and Welch kings. He was a young gentleman whose duty it was to sit on the floor, with his back towards the fire, and hold the king's feet in his bosom all the time he sat at table, to keep them warm and comfortable: a piece of state and luxury happily unknown in modern times.

Feet of horses. These in the manage are an object of great and deserved attention and regulation, in order to prevent the multiplicity of evils to which they are liable. These consist chiefly of cracks in the heels, scratches or lacerations, stubs and bruises of the outer sole, or upon the verge of the coronet, between hair and hoof, corns, sandcracks, thrushes, canker, quitor, ringbone, and foot-founder; exclusive of the frequent injuries produced by improper shoeing.

Most of these will be found treated of under their separate heads, or in the article VETERINARY MEDICINE.

The feet of different horses vary exceedingly in what may be termed the texture or property of the hoof; and this is, in general, regulated by the colour of the legs and feet. There are few horses with white heels but what have white hoofs also, and these are always more susceptible of defects and weakness than those of an opposite description. The sound, firm, dark-coloured hoof, of the bay, brown, or black horse, is seldom defective; no other colours are to be equally depended upon, most of them exhibiting weak, thin soles, with a prominence on each side the frog, occasioned by a too feeble and inadequate resistance to the force of the membraneous mass within; feet of this description are also frequently found to have a brittle hoof, the edges of which are incessantly splitting, and threatening sand-cracks, or thrushes, or some other ill state of the frog

To preserve the feet of a horse perfectly sound, and free from the ills to which they are subject, cleanliness is the leading step. After exercise or use, as soon as the body is drest, the dirt or gravel should be carefully taken from under the shoes with a picker, the feet well washed, the legs and heels rubbed dry, the bottom stopped with cow dung, and the hoofs oiled with a brush moistened with spermacæti oil. Horses left with wet legs and heels, after a severe chace, or long journey, particularly in sharp easterly winds, or during frost and snow, will have cracks or scratches to a certainty.

The state of the shoes should be constantly attended to. Permitted to continue too long upon the feet, the growth of the hoof brings the shoe forward, and consequently renders it too short at the heel; where it begins to indent, and sinking upon the foot, soon presses upon the outer sole, producing pain or disquietude in some horses, and laying a foundation for corns in others. Horses, in moderate work, require new shoes once a month upon an average. The penurious plan of removing shoes half worn never renders a service adequate to the expense, and only tends to a quicker destruction of the hoof.

FE'ETLESS. *a.* (from *feet.*) Being without feet (*Camden*).

To FEIGN. *v. a.* (*feindre*, French.) 1. To invent (*Ben Jonson*). 2. To make a show of (*Spenser*). 3. To do upon some false pretence (*Pope*). 4. To dissemble; to conceal: obsolete (*Spenser*).

To FEIGN. *v. n.* To relate falsely; to image from the invention (*Shakspeare*).

FE'IGNEDLY. *ad.* (from *feign.*) In fiction; not truly (*Bacon*).

FE'IGNER. *s.* (from *feign.*) Inventer; contriver of a fiction (*Ben Jonson*).

FEINT. *participial a.* (for *feigned*; or *feint*, French.) Counterfeit; seeming (*Locke*).

FEINT, in fencing, a show of making a thrust at one part, in order to deceive the enemy, that you may really strike him in another. A simple feint is a mere motion of the wrist, without stirring the foot.

FEINT, in music. See DIESIS.

FEITHIUS (Everard), a learned man of Elburg, in Germany. He quitted his own country on the invasion of it by the Spaniards under Spinola, and went to Rochelle. As he was one day walking in the street with his servant, a person standing at a door invited him in, and from that time he was never seen more. He was then young, but he had given the most promising testimonies of his talents. In 1677 appeared at Leyden a piece of his, entitled, Antiquitatum Homericarum Libri quatuor, 12mo. There are also some other books of his in print.

FEL. (*fel*, *fellis*.) See BILE.

FEL-WORT. So called from its bitter taste like bile. See GENTIANA.

FELANDERS. *s.* Worms in hawks.

FELAPTON, in logic, one of the six first moods of the third figure of syllogisms, wherein the first proposition is an universal negative, the second an universal affirmative, and the third a particular negative.

FELDSPATUM. Felspar. In mineralogy, a genus of the class earths, order siliceous; consisting for the most part of silica, some alumine and potash, and a very small quantity of lime and oxyd of iron; hard, lightish, shining, lamellar, breaking into fragments which present four faces mouldering into argil, parasytical; not effervescing with nitric acid, easily melting without ebullition into a pellucid glass. Six species.

1. F. cubicum. Cubic Felspar: Petrilite. Reddish-brown; of a glassy lustre, and somewhat splintery fracture; breaking into cubic fragments which are not specular; falling spontaneously into crustose fragments. Found, though rarely, in Saxony, of a common, indefinite form, diaphanous, or somewhat opake; fragments cubic, or so inclining, the faces of which are not polished; very brittle; and at 160 degrees of heat whitening and concreting without any farther sign of fusion: specific gravity 3,081.

2. F. vulgare. Common felspar. Of a glassy lustre and foliated texture, breaking into rhomboidal fragments with four specular faces. Of this there are four varieties:

α Of a common, indefinite form.
β Opake.
γ Transparent.
δ In the form of crystals.

The figures of these crystals again are very different in different species: prismatic, parallelopiped, unequal, eight-sided right angles, four-sided oblique angles, six-sided oblique angles. Found every where in primitive mountains, forming a part of granite, porphyry and gneiss rocks, compact, solid and incorporated with other substances; generally moulders into a kind of porcelane clay; are commonly flesh-colour, blueish-gray, yellowish-white, milk-white, or brownish-yellow; rarely blue, or olive-green, very rarely black; texture in straight shining foliations; cross fracture uneven; when heated the crystalline tribes often decrepitate; it is less hard than quartz, but strikes fire with steel; specific gravity from 2,272 to 2,594: and contains

silica	62,83
alumine	17,02
potash	16,00
lime	3,00
oxyd of iron	1,00
water, &c.	,15
	100,00

3. F. variabile. Labradore spar. Labradore stone: Of a vivacious lustre, reflecting various colours in certain positions of light, of a foliated texture, breaking into rhomboidal fragments with four specular faces. Found on the Labradore coast, the island St. Paul's, and in various parts of America, and Europe, in round masses and detached, and often containing schorl, mica of pyrites; colour dark or light grey, diaphanous or semipellucid, receiving a high polish and reflecting various tints of blue, purple, red, green, &c. in certain positions, in spots or stripes; specific gravity from 2,6700 to 2,6925.

4. F. lunare. Moon-stone. Pure felspar. Pellucid, white, of a high lustre, and straight lamellar texture, breaking into rhomboidal fragments. Found in Ceylon and Switzerland, Bohemia and Saxony, in solid masses, and also crystallized; the crystals rhomboidal, of irregular, angular, broad six-sided columns terminating in pyramids, and in rectangular four-sided plates; colour white with sometimes a shade of yellow, green, or red, the surface often reflecting iridescent colours; the fragments often appear striated. Specific gravity 2,559.

5. F. fibrosum. Fibrous felspar. Fibrous, with the fibres parallel, and in distinct layers. Found scatteringly in Bohemia, with frequently the vestiges of quartz or mica; colour usually brown; shining internally like nacre or mother-of-pearl, breaking into indeterminate fragments; and is harder than rock-crystal.

6. F. oculus catus. Cat's-eye. Diaphanous; of an imperfectly foliated texture, exhibiting parallel fibres internally, breaking into somewhat irregular fragments. Found in Ceylon and Siberia, of a nearly square figure, with sharp edges, and considerable brilliancy; colour grey, with a tinge of green, yellow, or white; in certain positions reflecting a splendid white like the eye of a cat, sometimes brown with a yellow or red tinge; its texture is so compact that the foliations are scarcely discernible, and it is hard enough to strike fire with steel: specific gravity 2,625 to 2,660.

FELICITAS, Felicity, a heathen divinity. She was the daughter of Hercules, as Euripides and Pausanias say, and deserved divine honours, because she sacrificed herself for the Athenians against the Lacedemonians, according to the answer of the oracle.

Public Felicity had many altars and temples at Rome, as appears from Roman historians, and was called Faustitas, especially in relation to private felicity. In this sense Horace speaks of her, when he says,

Tutus bos etiam rura perambulat,
Nutrit rura Ceres, almaque Faustitas.

St. Austin speaks of this goddess in the 4th Book de Civitate Dei, c. 18. and shews that Felicity is the same with good Fortune, and that the Romans acknowledged themselves that Felicity, Virtue and Victory were neither gods nor goddesses, but only gifts of God, seeing that they demanded them of Jupiter. Wherefore if we consider what they meant by adoring Felicity, Virtue and Victory like divinities, it is nothing else than the adoring the supreme Divinity, as the dispenser of these great favours.

Felicity was represented like a divinity sitting on a throne, holding with her right hand Mercury's wand, and with the left a horn of plenty, with this motto Felicitas Publica, as we see in a medal of the empress Julia Mammea. Lucullus built her a temple at Rome, and Julius Cæsar began another, which Lepidus finished.

To FELI'CITATE. *v. a.* (*feliciter*, Fr.) 1. To make happy (*Watts*). 2. To congratulate (*Brown*).

FELICITA'TION. *s.* (French; from *felicitate.*) Congratulation.

FELI'CITOUS. *a.* (*felix*, Latin.) Happy.

FELI'CITY. *s.* (*felicitas*, Latin.) Happiness; prosperity; blissfulusss (*Arbuthnot*).

FE'LINE. *a.* (*felinus*, Latin.) Like a cat; pertaining to a cat (*Grew*).

FELIS. In zoology, a genus of the class mammalia, order feræ. Fore-teeth intermediate ones equal; grinders three; tongue prickly backwards; claws retractile.

A tribe temperate in its habits; that easily climbs trees; swift; sees best by night; when falling from a height alights on the feet; the glans penis muricate backwards; suddenly springs on its prey; sucks the blood and then devours it; waves the tail when in sight of the prey; refuses vegetables except from necessity: females bring many young: teats eight; four pectoral, four abdominal. Twenty-three species: of which the following are chief. See Nat. Hist. Pl. CXI. CXII. CXIII. CXIV.

1. F. leo. Lion. Body pale tawny. Head large, rounded; forehead square, eyes very large; lips pendulous; heart large; male a fourth part larger than the female; sometimes eight feet long; chest shaggy; sides of the head and neck with a yellowish brown mane about two feet long; tail bushy at the extremity.

Inhabits Africa: more rarely the deserts of Persia, India, Japan; mild; preys on horses and other larger quadrupeds, and, when pressed by severe hunger, on man: afraid of flame; restrained by dogs; urines backwards; when young is easily tamed; roars terribly; sleeps in the sun; eats every third day; lazy; slow; leaps upon its prey; breath fetid; smell weak. Its flesh is eaten by the Africans.

The strength of the lion is prodigious; he is said to be able to break the back of a horse by a single stroke of his paw; to carry off with ease a middle-sized ox or a buffalo; and to break the bones with his teeth with perfect ease and swallow them with the flesh. His duration is uncertain: Buffon calculates it under thirty years: but we have had lions in a state of confinement in the Tower who have lived sixty and even seventy years.

2. F. tigris. Tiger. Body with dark, long streaks, generally transverse and black with pale yellow between; length from twelve to fifteen feet. Inhabits the warmer parts of Asia, China, Japan and India: lives in woods and thickets near rivers; cunning, cruel, strong, of vast swiftness; infesting, and desolating man, especially in India. Even when tamed from the birth, will exercise his ferocity as soon as liberated; the male destroys his own progeny; will at times attack the lion; bounds from ambush upon its prey; like the lion has fetid breath; the most beautiful of all wild beasts. Is prodigiously powerful; and will carry off a buffalo without being apparently burdened by its weight. Is less terrified by flame than the lion, and has been known to carry off one out of a large party who were surrounding an immense fire made for the purpose of frightening wild beasts away.

3. F. pardus. Panther. Body upper parts marked with circular spots, lower with stripes: body colour bright tawny; spots black; streaks dusky: length seven feet. Inhabits Africa and the hot parts of Asia; does not attack man unless provoked; enters houses by nights and destroys cats; in other habits resembles the tiger.

4. F. uncia. Ounce. Body whitish with irregular black spots. Inhabits the north of Africa, Persia, and Hyrcania; less and milder than the former; may be tamed and trained to the chase: length about three and a half feet.

5. F. leopardus. Leopard. Body yellow with black spots nearly contiguous. Inhabits Africa; scarcely larger than the former, and similar in habits.

6. F. onca. Brasilian tiger. Body yellowish, with black, roundish, angular spots, yellow in the middle. Inhabits the whole of South America; in cruelty, but not in courage, resembles the tiger, leaping from ambush with three bounds upon its prey; fastens upon the shoulders of the horse, and carries away animals three times its own size: having tasted human blood, ever afterwards prefers it; eats even fishes, and devours crocodiles: is driven away by fire.

7. F. pardalis. Mexican cat. Ocelot. Body upper part striped; lower spotted; above brown; beneath whitish; length four feet; height two and a half. Inhabits South America and New Spain; runs up trees at the sight of dogs or men; ferocious, untameable; deceives monkeys by lying as if dead and then seizing them abruptly.

8. F. catus. Cat. Tail annulate. Varieties as follow.

- α Wild cat. Tail annulate with brown; body with blackish stripes; three dorsal ones longitudinal, lateral ones spiral.
- β Domestic cat. Less: hair shorter, thicker.
- γ Angora cat. Hair longer, silvery, silky, longest on the neck.
- δ Tortoise-shell cat. Variegated with black, white and orange.
- ε Blue cat. Hair blue-grey.
- ζ Red cat. A red stripe from the head down the back.
- η Chinese cat. Ears pendulous; hair shining, variegated with black and yellow.
- θ Yellow cat. Reddish yellow; head long; snout sharp; legs short; claws weak; ears round, flat.
- ι Madagascar cat. Tail twisted.

Inhabits the woods of Europe and Asia; domesticated every where; when tranquil purs, moving the tail: when irritated is very active, climbs, spits, emits a fetid odour; eyes shine at night; the pupil in the daylight forming a perpendicular line; walks with its claws drawn in; drinks sparingly; urine of the male corrosive; breath fetid; buries its excrements; makes a horrible mewling or caterwauling in its amours; mews after and plays with its kittens; wags its tail when looking after prey; the lion of mice, birds and the smaller quadrupeds; peaceful among its tribe; eats flesh and fishes; refuses hot and salted meats; washes behind its ears before a storm: back electric in the dark; when thrown up falls on its feet; is not infested with fleas; gravid sixty-three days; brings from three to nine young, which are blind for nine days after birth; delights in the aroma of marum, cat's mint and valerian.

9. F. Chaus. Caspian Lynx. Tail annulate near the tip, which is black; body brownish; yellow ears brown outwards, bearded and black at the tip. Inhabits woods and marshes of the Caspian sea: ferocious; resembles the wild cat in its habits; forsakes cultivated places; seldom climbs trees; wanders by night among swamps and fields; preying on fishes, mice, and birds.

10. F. Caracal. Persian Lynx. Body palish red-brown; ears black outwards, tips black bearded. Inhabits Barbary, Persia, and India; preys by night; tamed for hunting. The Bengal and the Lybian lynx differ only in order of colours.

11. F. Lynx. Common lynx. Tail obscurely annulate, black at the tip; head and body whitish-tan, spotted with black; ears bearded at the top.

- β Another variety, white with dark spots.
- γ Upper parts whitish yellow; beneath white.
- δ Yellowish-white with dusky spots: size of a fox: inhabits Europe, Asia, America, and Japan, among the thickest woods; preys

on deer and the smaller quadrupeds, and, if urged by hunger, on its own tribe; devours flocks in the fold; cunning; acute in sight and smell; gravid nine weeks; brings from three to four young.

FELIX, proconsul and governor of Judea, A. D. 53. He married first Drusilla, the grand-daughter of Antony, and secondly Drusilla, the daughter of Agrippa. It was before him that St. Paul was brought, and delivered an admirable discourse, which made the governor tremble. Nero recalled him on account of his rapacities and oppression.

FELIX (St.), an island of the S. Pacific ocean, N.N.W. of Juan Fernandes. Lat. 0. 26 S. Lon. 0. 86 W.

FELL. *a.* (felle, Saxon.) 1. Cruel; barbarous; inhuman (*Fairfax*). 2. Savage; ravenous; bloody (*Pope*).

FELL. *s.* (felle, Saxon.) The skin; the hide (*Shakspeare*).

To FELL. *v. a.* (*fellen*, German.) 1. To knock down; to bring to the ground. 2. To hew down; to cut down (*Dryden*).

FELL. The preterit of fall.

FE'LLER. *s.* (from *fell.*) One that hews down (*Isaiah*).

FELLETIN, a town of France, in the department of Creuse, noted for its manufactory of tapestry. Lat. 45. 53 N. Lon. 2. 6 W.

FELLI'FLUOUS. *a.* (*fel* and *fluo*, Lat.) Flowing with gall.

FELLING OF TIMBER. Many circumstances are well known and constantly observed in the felling of timber for building, which, though to a hasty observer they might appear trifling, yet prove, on experience, to be of the utmost consequence. One thing observed by M. Buffon, which very greatly increases the solidity and strength of timber, is, that the trees intended to be felled for service should be first stripped round of their bark, and suffered to stand and die upon the spot before the cutting. The sappy part, or blea of the oak, becomes by this means as hard and firm as the heart, and the real strength and density of the wood has been proved, by many experiments, to be greatly increased by it; nor is this a practice of any detriment to the proprietor, since the remaining stumps of these trees send up their young shoots as vigorously as if they had been cut down in their natural condition. When any tree is to be cut down for timber, the first thing to be taken care of is a skilful disbranching such limbs as may endanger it in its fall; many trees are utterly spoiled for want of a previous care of this kind. In arms of timber that are very great, it is always necessary to chop or sink in them close to the bole, and then, meeting it with downright strokes, it will be severed from the tree without splitting. In felling the tree, take care always to cut as close to the ground as possible, unless it is intended to be grubbed up; and the doing this is of advantage both to the timber, and to the wood; for timber is never so much valued, if it be known to grow out of old stocks.

FE'LLMONGER. *s.* (from *fell.*) A dealer in hides.

FE'LLNESS. *s.* (from *fell.*) Cruelty; savageness; fury; rage (*Spenser*).

FE'LLOE. *s.* (*felge*, Danish.) The circumference of a wheel (*Shakspeare*).

FE'LLOW. *s.* (fe, *faith*, and lag, *bound.*) 1. A companion; one with whom we consort (*Ascham*). 2. An associate; one united in the same affair (*Dryden*). 3. One of the same kind (*Waller*). 4. Equal; peer (*Fairf.*). 5. One thing suited to another; one of a pair (*Addison*). 6. One like another: as, this knave hath not his *fellow*. 7. A familiar appellation used sometimes with fondness; sometimes with contempt: as, *an honest or sorry* fellow. 8. Mean wretch; sorry rascal (*Swift*). 9. A member of a college, or any incorporated society (*Bacon*).

To FE'LLOW. *v. a.* To suit with; to pair with; to match (*Shakspeare*).

FELLOW-CO'MMONER. *s.* 1. One who has the same right of common. 2. A commoner at Cambridge of the higher order, who dines with the fellows.

FELLOW-CRE'ATURE. *s.* One that has the same Creator (*Watts*).

FELLOW-HEIR. *s.* Coheir (*Ephesians*).

FELLOW-HE'LPER. *s.* Coadjutor (*John*).

FELLOW-LABOURER. *s.* One who labours in the same design (*Dryden*).

FELLOW-SE'RVANT. *s.* One that has the same master (*Milton*).

FELLOW-SO'LDIER. *s.* One who fights under the same commander (*Shakspeare*).

FELLOW-STU'DENT. *s.* One who studies in company with another (*Watts*).

FELLOW-SU'FFERER. *s.* One who shares in the same evils (*Addison*).

FELLOW-FE'ELING. *s.* (*fellow* and *feeling*) 1. Sympathy (*L'Estrange*). 2. Combination; joint interest (*Arbuthnot*).

FE'LLOWLIKE. FE'LLOWLY. *a.* (*fellow* and *like*) Like a companion; on equal terms; companionable (*Carew*).

FE'LLOWSHIP. *s.* (from *fellow.*) 1. Companionship; consort; society (*Calamy*). 2. Association; confederacy (*Knolles*). 3. Equality. 4. Partnership; joint interest (*Dryden*). 5. Company; state of being together (*Shaks.*) 6. Frequency of intercourse; solid pleasure (*Bacon*). 7. Fitness and fondness for festal entertainments, with *good* prefixed (*Clarend.*). 8. An establishment in the college, with share in its revenues (*Swift*).

FELLOWSHIP, COMPANY, or PARTNERSHIP, is a rule in arithmetic, of great use in balancing accounts among merchants, and partners in trade, teaching how to assign to every one of them his due share of the gain or loss, in proportion to the stock he has contributed, and the time it has been employed, or according to any other conditions. Or, more generally, it is a method of dividing a given number, or quantity, into any number of parts, that shall have any assigned ratio to one another. And hence comes this general rule: Having added into one sum the several numbers that express the proportions of the parts, it will be,

As that sum of the proportional numbers:
Is to the given quantity that is to be divided::
So is each proportional number:
To the corresponding share of the given quantity.

This rule is usually distinguished into two cases, one in which time is concerned, or in which the stocks of partners are continued for different times; and the other in which time is not considered; this latter being called single fellowship, and the former double fellowship, in which the proportional numbers vary with the products of the stocks and their respective times. Double fellowship may be divided into several cases, some of which are difficult to a beginner: the best rules for their solution are given at p. 61, Keith's Arith.

FE'LLY. *ad.* (from *fell.*) Cruelly; inhumanly; savagely; barbarously (*Spenser*).

FELO DE SE, a felon of himself, is a person who, being of sound mind, and of the age of discretion, voluntarily kills himself: for if a person is insane at the time, it is no crime. But this ought not to be extended so far as the coroner's juries sometimes carry it, who suppose that the very act of self-murder is an evidence of insanity, as if every man who acts contrary to reason had no reason at all; for the same argument would prove every other criminal non compos, as well as the self-murderer. 3 Inst. 54.

All inquisitions of the offence, being in the nature of indictments, ought particularly and certainly to set forth the circumstances of the fact; as the particular manner of the wound, and that it was mortal, &c. and in conclusion add, that the party in such manner murdered himself 1 Salk. 377.

A felo de se forfeits all chattels real and personal, which he has in his own right; and also all such chattels real whereof he is possessed, either jointly with his wife, or in her right; and also all bonds and other personal things in action, belonging solely to himself; and also all personal things in action, and entire chattels in possession, to which he was entitled jointly with another, on any account except that of merchandize; but it is said that he shall forfeit a moiety only of such joint chattels as may be severed, and nothing at all of what he was possessed of as executor or administrator. Standf. P. C. 188, 189. Plow. 243, 262. 3 Inst. 55.

The further punishment of a felo de se is, to be buried in the highway, and a stake run through the body.

FE'LON, *s.* (*felon*, French.) 1. One who has committed a capital crime. 2. A whitlow; a tumour formed between the bone and its investing membrane. See Paronichia.

Fe'lon. *a.* Cruel; traiterous; inhuman (*Pope*).

FE'LONIOUS. *a.* (from *felon.*) Wicked; traitorous; villainous; malignant (*Wotton*).

FELO'NIOUSLY. *ad.* In a felonious way.

FE'LONIOUS. *a.* Wicked: not used (*Spenser*).

FELONY, in the general acceptation of law, comprises every species of crime which occasioned at common law the forfeiture of lands or goods. This most frequently happens in those for which a capital punishment either was or is liable to be inflicted; for those felonies which are called clergyble, or to which the benefit of clergy extends, were anciently punished with death in lay or unlearned offenders; though now, by the statute law, that punishment is for the first offence universally remitted.

Felony is always accompanied with an evil intention, and therefore shall not be imputed to a mere mistake or misanimadverion; as where persons break open a door to execute a warrant, which will not justify such a proceeding. But the bare intention to commit a felony is so very criminal, that at the common law it was punishable as felony, where it missed its effect through some accident, which no way lessened the guilt of the offender; but it seems agreed at this day, that felony shall not be imputed to a bare intention to commit it, yet it is certain that the party may be very severely fined for such an intention. 1 Haw. 65.

The punishment of a person for felony, by our ancient books, is, 1st, to lose his life; 2dly, to lose his blood, as to his ancestry, and so to have neither heir nor posterity; 3dly, to lose his goods; 4thly, to lose his lands, and the king shall have year, day, and waste, to the intent that his wife and children be cast out of the house, his house pulled down, and all that he had for his comfort and delight destroyed. 4 Rep. 124. A felony by statute incidentally implies, that the offender shall be subject to the like attainder and forfeiture, &c. as is incident to a felon at common law. 3 Inst. 47. See Burglary, Forgery, Homicide, Petit treason, Rape, Robbery, &c.

The word felony, or felonia, is of undoubted feodal original, being frequently to be met with in books of feuds, &c. but the derivation of it has much puzzled the juridical lexicographers, Pratæus, Calvinus, and the rest; some deriving it from the Greek φηλος, "an impostor or deceiver;" others from the Latin *fallo fefelli*, to countenance which they would have it called *fellonia*. Sir Edward Coke, as his manner is, has given us a still stranger etymology; that it is, *crimen animo felleo perpetratum*, "with a bitter or gallish inclination." But all of them agree in the description, that it is such a crime as works a forfeiture of all the offender's lands or goods. And this gives great probability to Sir Henry Spelman's Teutonic or German derivation of it: in which language indeed, as the word is clearly of feodal original, we ought rather to look for its signification, than among the Greeks and Romans. *Fe-lon* then, according to him, is derived from two northern words: fee, which signifies (we well know) the fief, feud, or beneficiary estate; and lon, which signifies price or value. Felony is therefore the same as "pretium feudi," the consideration for which a man gives up his fief; as we say, in common speech, such an act is as much as your life, or estate, is worth. In this sense it will clearly signify the feodal forfeiture, or act by which an estate is forfeited, or escheats, to the lord.

To confirm this, we may observe, that it is in this sense, of forfeiture to the lord, that the feodal writers constantly use it. For all those acts, whether of a criminal nature or not, which at this day are generally forfeitures of copyhold estates, are styled *feloniæ* in the feodal law: "scilicet, per quas feudum amittitur." As "si domino deservire noluerit; si per annum et diem cessaverit in petenda investitura; si dominum ejuravit, i. e. negavit se a domino feudum habere; si a domino in jus eum vocante, ter citatus non comparuerit;" all these, with many others, are still causes of forfeiture in our copyhold estates, and were denominated felonies by the feodal constitutions. So likewise injuries of a more substantial or criminal nature were denominated felonies, that is, forfeitures: as assaulting or beating the lord; vitiating his wife or daughter, "si dominum cucurbitaverit, i. e. cum uxore ejus concubuerit;" all these are esteemed felonies, and the latter is expressly so denominated, "si fecerit feloniam, dominum forte cucurbitando." And as these contempts, or smaller offences, were felonies or acts of forfeiture, of course greater crimes, as murder and robbery, fell under the same denomination. On the other hand, the lord might be guilty of felony, or forfeit his seignory to the vassal, by the same act as the vassal would have forfeited his feud to the lord. "Si dominus commisit feloniam, per quam vasallus amitteret feudum si eam commiserit in dominum, feudi proprietatem etiam dominus perdere debet." One instance given of this sort of felony in the lord is beating the servant of his vassal, so as that he loses his service: which seems merely in the nature of a civil injury, so far as it respects the vassal. And all these felonies were to be determined, "per juramentum sive judicium parium suorum," in the lord's court; as with us forfeitures of copyhold lands are presentable by the homage in the court-baron.

Felony, and the act of forfeiture to the lord, being thus synonymous terms in the feodal law, we may easily trace the reason why, upon the introduction of that law into England, those crimes which induced such forfeiture or escheat of lands (and, by a small deflexion from the original sense, such as induced the forfeiture of goods also) were denominated felonies. Thus it was that suicide, robbery, and rape, were felonies; that is, the consequence of such crimes was forfeiture; till by long use we began to signify by the term of felony the actual crime committed, and not the penal consequence. And upon this system only can we account for the cause, why treason in ancient times was held to be a species of felony; viz. because it induced a forfeiture.

Hence it follows, that capital punishment does by no means enter into the true idea and definition of felony. Felony may be without inflicting capital punishment, as in the cases instanced of self-murder, excusable homicide, and petit larceny: and it is possible that capital punishments may be inflicted, and yet the offence be no felony; as in the case of heresy by the common law, which, though capital, never worked any forfeiture of lands or goods, an inseparable incident to felony. And of the same nature was the punishment of standing mute, without pleading to an indictment; which at the common law was capital, but without any forfeiture, therefore such standing mute was no felony. In short, the true criterion of felony is forfeiture: for, as Sir Edward Coke justly observes, in all felonies which are punishable with death, the offender loses all his lands in fee-simple, and also his goods and chattels; in such as are not punishable, his goods and chattels only.

The idea of felony is indeed so generally connected with that of capital punishment, that we find it hard to separate them; and to this usage the interpretations of the law do now conform. And therefore, if a statute makes any new offence felony, the law implies that it shall be punished with death, viz. by hanging, as well as with forfeiture: unless the offender prays the benefit of clergy; which all felons are entitled once to have, unless the same is expressly taken away by statute.

Felonies by statute are very numerous; and as this work will not admit of a proper enumeration, we must refer to the Table of the quarto edition of the Statutes, where they are set forth in alphabetical order.

FELT. The preterit of feel.

FELT. *s.* (felt, Saxon.) 1. Cloth made of wool united without weaving (*Shakspeare*). 2. A hide or skin (*Mortimer*).

To FELT. *v. a.* (from the noun.) To unite without weaving (*Hale*).

FELT-SPAR. See FELDSPATUM.

FELTING. The process by which hair, wool, or silk is worked into a compact texture, without spinning or weaving; chiefly employed in the manufacture of hats.

If any species of hair, wool, or even silk be inspected cursorily, it appears polished, yet if rubbed between the fingers, held by the point, and drawn to the root, the resistance is more considerable than in the contrary direction; the motion is likewise tremulous, and there is a chirping noise. Likewise, if a hair be held between the finger and thumb, and rubbed by alternately moving them in the direction of its length, a progressive motion will be produced, which is always with the root end foremost. The same structure may be shown by tying two hairs together, and then giving the knot a few blows between the palms of the hands, for the knot will either untie itself or draw closer, according as the asperities of the surfaces are placed in tying. From this mechanism, which is common to wool, and every other kind of hair, which, according to Monge, have their surface composed either of scales like those of fish, or imbricated cones, like the horns of animals, may be deduced the harsh feel of woollens against the skin, compared with linens, and their irritating effect upon wounds. It is this disposition to progressive motion end ways, which causes hair to entangle and felt itself when pressed by the hatter between two pieces of linen, to which they do not unite from its fibres being smooth. Cut hair is better than such as is plucked, because the bulbous roots prevent the progressive motion. The fibres of wool being crooked, must naturally move in curves; but those of the hare, rabbit, and beaver, being straight, cannot be used alone in felting, until after a previous operation, which consists in rubbing them with a nitrous solution of mercury, by means of a brush, before they are separated from the skin. The solution acting only on one side of the hairs renders them crooked.

The straight hairs are used for felting hats, in which operation the action must be continued for a determinate time only, otherwise they would pass through and come out on the opposite side. The disposition of wool to felt itself, is an impediment to the carding and spinning processes; hence oil is used, which diminishes the power of the hairs to act on each other; but at the fulling mill, soap and marle are used, which carry off the oil, and restore the wool to its former state, in consequence of which, the fulling process takes place, and the cloths are rendered narrower, shorter, closer, stronger, and thicker. The balls of hair in the stomach of certain animals which lick each other, are felted by the action of the stomach. To which may be added, that a similar cause is the chief reason why beds of cock and hen feathers are inferior to those of goose feathers; the latter being much straighter, do not form the hard flat balls which abound in the former. This work, which is entirely mechanical, forms the felt, which is a kind of soft spungy stuff, of greater or less thickness, and in its first state of a loose and imperfect texture. Its fibres would soon disunite from their weak connection; hence to give it requisite density and consistence, it undergoes the operation of fulling.

This, which is in a certain respect the completion of felting, has for its object the intimate connection of the fibres, and a more perfect and durable cohesion of the whole mass. For this purpose, the mere mechanical act of pressure is insufficient; the result would be a formless mass without consistence. For the fulling, it is necessary to make use of a bath of water heated nearly to ebullition, into which are put, in France, ten or fifteen pounds of lees of wine, for every hundred pounds of water. The heat is kept up the whole time of working, and every three or four hours a new quantity of lees is added. Into this bath the workmen plunge their felt, and begin their second process. The felt is dipped in, and immediately taken out again and squeezed, bent and rolled, by pressure in different directions, sometimes with the hand defended by leather, and sometimes by a roller, or other similar instrument. This is repeated until the stuff is well condensed, and has acquired the requisite solidity; hence the lees added must be considered as a chemical solvent, acting directly on the substance of the hair, and producing, either by softening or swelling it, an alteration necessary to insure the cohesion of the different fibres of the stuff.

The editor of the French Encyclop. Method. affirms, that it is the alkali or potash of the lees which determines the fulling. Chaussier has, however, found the assertion of the editor to be erroneous: to prove which, nothing more is necessary than to dip a piece of blue paper in the bath, which instantly becomes red, and if after several hours work the state of the bath be examined again, it is found that the acting part, which is the acidulous tartrite of potash, is partly exhausted, and the workmen soon perceive the want of a new portion; and if we consider the sparing solubility of the acidulous tartrite in cold water, it will appear why the water must be kept nearly boiling. Hence it is evident, that it must act by the portion of acidule it contains. It was this first observation that induced Chaussier to substitute the sulphuric acid instead of the lees, which although unknown to this chemist, had been used as a great secret in foreign manufactures. He found twelve drachms of this acid sufficient for one hundred pounds of water, and that this method was much preferable to that of wine lees, as being not only more convenient and economical, but the health of the workmen was not impaired by the excess and duration of the heat, the thick vapours, and the disgusting odour which exhales from the bath, particularly when the lees had been putrid and mouldy. A boiling heat is not necessary as formerly; ninety or one hundred degrees of Fahrenheit being sufficient for good fulling. It also saves fuel; cauldrons of lead may be substituted for those of copper, and the felt produced is of superior quality.

With respect to this process, it is only necessary to mention, that hats felted in the new manner take the dye better than in the old way, and that oak bark is substituted to nut-gall with advantage.

This process, called preparation, consists in lining the inner surface of the crown, as well as of the brim of the hats, with a glutinous substance, which, by drying, gives firmness to the work and preserves its form. This chemist found a solution of glue in a decoction loaded with the mucilage of linseed oil the best; whilst Marguerou recommends the mucilage extracted from the leaves of the horse-chesnut when its foliage is in full vigour. A strong decoction of these leaves, which contains a great portion of mucous and adhesive matter, is used with the glue. These are better than gum arabic and other friable gums which become brittle.

To FE'LTRE. *v. a.* (from *felt.*) To clot together like felt (*Fairfax*).

FE'LUCCA. *s.* (*feleu*, French.) A small open boat with six oars.

FE'MALE. *s.* (*femelle*, French.) A she; one of the sex which brings young (*Shakspeare*).

Fe'male. *a.* Not male; not masculine; belonging to a she (*Milton*).

Female plant. Which has female flowers only. Female flower; which has pistils or stigmas, without stamens, or at least anthers.

Female screw. See Screws.

FEME COVERT. *s.* (French.) A married woman.

Feme sole. *s.* (French.) A single woman.

FEMINA'LITY. *s.* (from *fœmina*, Lat.) Female nature (*Brown*).

FE'MININE. *a.* (*fœmininus*, Latin.) 1. Of the sex that brings young; female. 2. Soft; tender; delicate (*Milton*). 3. Effeminate; emasculated (*Raleigh*).

Fe'minine. *s.* A she; one of the sex that brings young; a female (*Milton*).

Feminine, in grammar, one of the genders of nouns. See Gender. The feminine gender is that which denotes the noun or name to belong to a female. In the Latin, the feminine gender is formed of the masculine, by altering its termination; particularly by changing *us* into *a*. Thus, of the masculine *bonus equus*, "a good horse," is formed the feminine *bona equa*, "a good mare;" so, of *parvus homo*, "a little man," is formed *parva fœmina*, "a little woman," &c. In French, the feminine gender is expressed, not by a different termination, but by a different article: thus, *le* is joined to a male, and *la* to a female. In English, we are generally more strict, and express the difference of sex not by different terminations, nor by different particles, but different words; as boar and sow, boy and girl, brother and sister, &c. though sometimes the feminine is formed by varying the termination of the male into *ess*; as in abbot, abbess, &c.

FE'MORAL. *a.* (*femoralis*, Lat.) Belonging to the thigh.

FE'MORIS OS. See Femur.

FEMUR. (*femur.*) In anatomy. *Os femoris.* The thigh bone. A long cylindrical bone, situated between the pelvis and tibia. Its upper extremity affords three considerable processes; these are, the head, the trochanter major, and trochanter minor.—The head, which forms about two thirds of a sphere, is turned inwards, and is received into the acetabulum of the os innominatum, with which it is articulated by enarthrosis. It is covered by a cartilage, which is thick in its middle part, and thin at its edges, but which is wanting in its lower internal part, where a round spongy fossa is observable, to which the strong ligament, usually, though improperly, called the round one, is attached. This ligament is about an inch in length, flattish, and of a triangular shape, having its narrow extremity attached to the fossa just described, while its broader end is fixed obliquely to the rough surface near the inner and anterior edge of the acetabulum of the os innominatum, so that it appears shorter internally and anteriorly than it does externally and posteriorly.

The head of the os femoris is supported obliquely, with respect to the rest of the bone, by a smaller part, called the cervex or neck, which, in the generality of subjects, is about an inch in length. At its basis we observe two oblique ridges, which extend from the trochanter major to the trochanter minor. Of these ridges, the posterior one is the most prominent. Around this neck is attached the capsular ligament of the joint, which likewise adheres to the edge of the cotyloid cavity, and is strengthened anteriorly by many strong ligamentous fibres, which begin from the lower and anterior part of the ilium, and spreading broader as they descend, adhere to the capsular ligament, and are attached to the anterior oblique ridge at the bottom of the neck of the femur. Posteriorly and externally, from the basis of the neck of the bone a large unequal protuberance stands out, which is the trochanter major. The upper edge of this process is sharp and pointed posteriorly, but is more obtuse anteriorly. A part of it is rough and unequal, for the insertion of the muscles; the rest is smooth, and covered with a thin cartilaginous crust, between which and the tendon of the glutæus maximus that slides over it, a large bursa mucosa is interposed. Anteriorly, at the root of this process, and immediately below the bottom of the neck, is a small process called trochanter minor. Its basis is nearly triangular, having its two upper angles turned towards the head of the femur and the great trochantur, while its lower angle is placed towards the body of the bone. Its summit is rough and rounded.—These two processes have gotten the name of trochanters, from the muscles that are inserted into them being the principal instruments of the rotatory motion of the thigh. Immediately below these two processes the body of the bone may be said to begin. It is smooth and convex before, but it is made hollow behind by the action of the muscles. In the middle of this posterior concave surface is observed a rough ridge, called *linea aspera*, which seems to originate from the trochantes, and extending downwards, divides at length into two branches, which terminates in the tuberosities near the condyles.—At the upper part of it, blood vessels pass to the internal substance of the bone, by a hole that runs obliquely upwards.

The lower extremity of the os femoris is larger than the upper one, and somewhat flattened, so as to form two surfaces, of which the anterior one is broad and convex, and the posterior one narrower and slightly concave. This end of the bone terminates in two large protuberances, called *condyles*, which are united before so as to form a pulley, but are separated behind by a considerable cavity, in which the crural vessels and nerves are placed secure from the compression to which they would otherwise be exposed in the action of bending the leg. Of these two condyles, the external one is the largest; and when the bone is separated from the rest of the skeleton, and placed perpendicularly, the internal condyle projects less forwards, and descends nearly three-tenths of an inch lower than the external one: but in its natural situation, the bone is placed obliquely, so that both condyles are then nearly on a level with each other. At the side of each condyle, externally, there is a tuberosity, the situation of which is similar to that of the condyles of the os humeri. The two branches of the linea aspera terminate in these tuberosities, which are rough, and serve for the attachment of ligaments and muscles.

FEN, a general name for boggy or marshy land, subject to be overflowed with water.

Several statutes have been made for the draining of fens, chiefly in Kent, Cambridgeshire, Huntingdonshire, and Lincolnshire: in consequence of which these lands are generally kept in such a state, as to produce good crops of oats, and other corn in favourable seasons. Indeed the fens in Lincolnshire, &c. bring many advantages to their inhabitants: particularly in the prodigious quantities of fish and fowls which they produce; and in the excellent pasturage for cattle. The fens abound in a sort of herbage that is very nourishing to sheep, oxen, and horses. The duck, mallard, teal, &c. are in such plenty, as scarcely to be conceived. Great advantage is derived from the geese that abound here, beside the food which they afford; that is, from their feathers and quills, and the produce of these is so great, that the custom-house books in the town of Boston shew, that there are frequently sent away in one year three hundred bags of feathers, each bag containing a hundred and a half weight. It may be thought strange by persons unacquainted with these things, but it is a certain truth, that the owners pluck these geese five times a year for the feathers, and once for their quills. Each plucking affords about a pound; and many people have a thousand geese at a time, or more. They are kept at no charge, except in deep snowy weather, when it is necessary to feed them with corn.

FE'NBERRY. *s.* (*fen* and *berry.*) A kind of blackberry (*Skinner*).

FENCE. *s.* (from *defence.*) 1. Guard; security; outwork; defence. 2. Enclosure; mound; hedge (*Dryden*). 3. The art of fencing; defence (*Shakspeare*) 4. Skill in defence (*Shakspeare*).

Fence, in botany, a term used by Dr. Withering, and some other writers, for the involucre.

To Fence. *v. a.* 1. To enclose; to secure by an enclosure or hedge (*Fairfax*). 2. To guard; to fortify (*Milton*).

To Fence. *v. n.* 1. To practise the arts of manual defence; to practise the use of weapons (*Locke*). 2. To guard against; to act on the defensive (*Locke*). 3. To fight according to art (*Dryden*).

FE'NCELESS. *a* (from *fence.*) Without enclosure; open (*Rowe*)

FE'NCER. *s.* (from *fence.*) One who teaches or practices the use of weapons (*Herbert*).

FE'NCIBLE. *a.* (from *fence.*) Capable of defence (*Addison*).

FENCE-MONTH, the month wherein deer begin to fawn, during which it is unlawful to hunt in the forest. It commences 15 days before midsummer, and ends 15 days after it. This month, by ancient foresters, is called defence-month.

FENCING, the art of making a proper use of the sword, as well for attacking an enemy as for defending one's self. This art is acquired by practising with foils, called in Latin *rudes*; whence fencing is also denominated *gladiatura rudiaria.* It is one of the exercises learnt in academies; and is an accomplishment both agreeable and useful: agreeable, as it affords gentlemen a noble and distinguished amusement: useful, as it forms the body; and furnishes the faculty of defence, whether it be of their honour or their life, when the one or the other is attacked by those turbulent and dangerous persons whose correction is of service to society in general.

Pyrard assures us, that the art of fencing is so highly esteemed in the East Indies, that none but princes and noblemen are allowed to teach it. They wear a badge or cognizance on their right arms, called in their language *esaru*; which is put on with great ceremony, like the badges of our orders of knighthood, by the kings themselves.

Fencing is divided into two parts, simple and compound. Simple fencing is that performed directly and nimbly on the same line; and is either offensive or defensive. The principal object of the first is whatever may be attempted, in pushing or making passes, from this or that point, to the most uncovered part of the enemy. The second consists in parrying and repelling the thrusts aimed by the enemy. Compound fencing includes all the possible arts and inventions to deceive the enemy, and make him leave that part we have a design on bare and unguarded, upon finding we cannot come at it by force, nor by the agility of the simple play. The principal means hereof are, on the offensive side, feints, appeals, clashings, and entanglings of swords, half-thrusts, &c., and, on the defensive, to push in parrying. Of all which a detail would be here useless, as they are only to be understood and acquired from personal instructions conjoined with practice.

FE'NCINGMASTER. *s.* (*fence* and *master.*) One who teaches the use of weapons.

FE'NCINGSCHOOL. *s.* A place in which the use of weapons is taught (*Locke*).

To FEND. *v. a.* (from *defend.*) To keep off; to shut out (*Dryden*).

To Fend. *v. n.* To dispute; to shift off a charge (*Locke*).

FE'NDER. *s.* (from *fend.*) 1. An iron plate laid before the fire to hinder coals that fall from rolling forward to the floor. 2. Any thing laid or hung at the side of a ship to keep off violence.

FENELON (Francis de Salignac de la Motte), archbishop of Cambray, was born of an illustrious family, at the castle of Fenelon, in the province of Perigord, in 1651. He completed his studies at the university of Paris, where, while young, he distinguished himself as an elegant preacher. In 1686 he was employed as one of the missionaries sent along the coast of Saintonge to convert the protestants. In 1689 he was made tutor to the dukes of Burgundy, Anjou, and Berri, and in 1693 chosen member of the French academy. The improvement which his pupils made under him gave so much satisfaction, that the king presented him with the abbey of St. Valery, and shortly after preferred him to the archbishopric of Cambray. About this time he fell into considerable trouble, occasioned by his book, intituled, an Explication of the Maxims of the Saints, which abounded with mystical sentiments. Bossuet, bishop of Meux, who was a violent enemy to madame Guyon, the celebrated mystic, soon discovered a similarity between her notions and those of the archbishop of Cambray. Several conferences took place between these two prelates on this subject, and at last the cause was referred to the pope, who condemned Fenelon's book. The good archbishop submitted quietly to this sentence, and even read it publicly himself in his cathedral of Cambray. He wrote many other books. The work that gained him the greatest reputation, and which will render his memory immortal, is his Adventures of Telemachus; the style of which is natural, the fictions well contrived, the moral sublime, and the political maxims tending all to the happiness of mankind. Hence it is thought, as the printing of this work was stopped at Paris, that the prelate's heresy was in politics instead of religion; and though his disgrace was prior to this work, he had, while he was tutor to the young princes, taught them the principles asserted and exemplified in Telemachus. He spent the remainder of his days in his diocese, beloved by all who knew him, and universally admired. In the last war of Louis XIV. with the allies, the duke of Marlborough had so profound a regard for him, that he gave express orders to his army not to injure the lands of the archbishop. He died in 1715. Besides the above works, we must mention, as peculiarly excellent, his Dialogues of the Dead, in 2 vols.; Dialogues on Eloquence in general, and that of the Pulpit in particular; a Treatise on the Education of Daughters; a Demonstration of the Existence of God; Spiritual Works; and Directions for the Conscience of a King.

FENERATION. *s.* (*feneratio*, Latin.) Usury; the gain of interest (*Brown*).

FENESTRATE, in entomology, a term applied to the hyaline spots on the wings of butterflies.

FENESTRELLE, a town and fort of Piedmont, in the valley of the Vaudois. Lat. 85. 10 N. Lon. 7. 21 E.

FENESTRA OVALIS. (from *fenestra*, a window, or φαινω, to shine.) In anatomy, an oblong or elliptical foraman, between the cavity of the tympanum, and the vestibulum of the ear. It is shut by the stapes.

FENESTRA ROTUNDA, a round foramen, leading from the tympanum to the cochlea of the ear. It is covered by a membrane in the fresh subject.

FENGELD, in our ancient writers, is used for a tax or imposition raised for repelling of enemies.

FENNEL. See FÆNICULUM, and ANETHUM.

FENNEL-HOGS. See PEUCEDANUM.

FENNEL-FLOWER, in botany. See NIGELLA.

FENNEL (Giant), in botany. See FERULA.

FENNEL (Sea), in botany. See CRITHUSUM.

FENNY. *a.* (from *fen.*) 1. Marshy; boggy; moorish. 2. Inhabiting the marsh.

FENNY STRATFORD, a town of Buckinghamshire, having a market on Mondays. It is 45 miles N.W. of London.

FENNYSTONES. *s.* A plant.

FENSUCKED. *a.* (*fen* and *sucked.*) Sucked out of marshes (*Shakspeare*).

FENUGREEK. See FÆNUGRECUM, and TRIGONELLA.

FENTON (Elijah), descended from an ancient family, was born at Shelton, near Newcastle, but in what year is uncertain. He was the youngest of 12 children, and was intended for the ministry; but embracing principles contrary to the government, while at Cambridge, he became disqualified for entering into holy orders. After he quitted the university, he was secretary to the earl of Orrery; but he seems to have spent the most of his life amongst his friends and relations, and used to pay an annual visit to his elder brother, who enjoyed an estate of 1000*l.* a-year. He was a man of great tenderness and humanity, enjoyed the fairest reputation, and was much esteemed by Mr. Pope, who, when he died in 1730, paid him the tribute of a very elegant epitaph. He published a volume of poems in the year 1717; and in 1723 was acted his tragedy of Mariamne, built upon the story collected from Josephus in the third volume of the Spectator.

FEOD, or FEUD, a right which a vassal hath in lands or some immoveable thing of his lord's, to use the same, and take the profits thereof hereditarily, rendering unto the lord such feodal duties and services as belong to military tenure, &c. and the property of the soil always remaining to the lord

FEODAL, of or belonging to a feud or fee.

FEODAL SYSTEM, the constitution of fiefs or feuds. It is about 12 centuries ago, since this system was so universally received in Europe, that sir Henry Spelman calls it the law of nations in our western world. Hence it deserves our attention in a particular manner; a knowledge of feuds being indispensably requisite for a proper understanding either of the civil government of our own country, or the laws by which its landed property is regulated.

The military policy of the Celtic or northern nations, known by the names of Goths, Vandals, Franks, Huns, and Lombards, furnished the original constitution or system of feuds. These people pouring out into vast multitudes from the same *officina gentium*, or, store-house of nations, over-ran all the European countries on the declension of the Roman empire. They brought the feudal system along with them from the countries out of which they emigrated; and, supposing it to be the most proper method of securing their new conquests, they introduced it into their more southerly colonies.

According to this system, the victorious general allotted considerable tracts of land to his principal officers; while they, in like manner, divided their possessions among the inferior officers, and even those common soldiers who were thought to be the most deserving. Allotments of this kind were named feoda, fiefs, fees, or feuds, from a combination of words, in the language of these barbarians, signifying a reward or stipend bestowed on certain conditions. The condition upon which these rewards were given was, that the possessors should faithfully serve the person from whom they were received, both at home and abroad, in the military way. To this they engaged themselves, by a *juramentum fidelitatis*, or oath of fealty; in the event of a breach of which, either by not performing the service agreed upon, by deserting their lord in time of battle, &c. the lands were to return to their original possessor.

Thus the possessors of feodal allotments became interested in the defence of them; and not only the receivers, but those who gave them, were equally and mutually bound to defend their possessions, none of them being able to pretend any right but that of conquest. For this purpose, government and subordination were absolutely necessary; it being impossible to conduct any system of defence where every thing was tumultuous and irregular. Every person, therefore, who was a feudatory, i. e. who had received lands, was bound to do every thing in his power to defend the lord of his fee; while, on the other hand, the latter was no less subordinate to his immediate superior; and so on to the prince himself. In like manner a reciprocal bond of defence existed down from the prince to the lowest feodists.

Such were the foundations on which the feodal system was established; and the natural consequence was, a military subjection throughout the whole community. The prince could always collect an army of feudatories ready to defend not only the kingdom in general, but the particular possessions of each person; and the propriety of this constitution was soon apparent in the strength which these newly-erected kingdoms acquired, and the valour with which their conquests were defended.

Besides these feodal grants, however, which were held only on the terms of military service above-mentioned, there were others called *allodial*, which were given upon more enlarged principles. To these every free man had a title; and could not only claim his territory as well as the rest, but dispose of it at his pleasure; and this freedom was denominated *allodiality*. These allodials, however, were not exempted from military service. A part of their freedom consisted in liberty to go to the wars; for this, in the barbarous times we speak of, was the only way to acquire any degree of renown. Only the slaves were destined to follow the arts of peace; while every free person was not only at liberty to defend his country, but under an obligation to do it in case of any urgent necessity.

Thus there was a feodal and a national militia. The free people only were allowed to possess property; the feudal vassals constituted the army, properly so called; while the national militia was composed of the allodial proprietors. This allodiality was not confined to landed property, but included likewise moveable estates or money; so that proprietors of the latter kind were obliged also in times of danger to bear arms and appear in the field. Between the feodal and allodial proprietors, however, there was this farther difference, that the latter had no concern with any private quarrels which might take place among the lords themselves; so that they were never obliged to appear in the field, unless when called forth by the sovereign against the enemies of the nation at large. This circumstance we might suppose to be an advantage, but it ultimately operated otherwise, becoming the means of changing the allodial right into a feodal tenure. For some time the holders of fiefs had an eminent advantage over the allodial proprietors, owing to the imperfection of government in those days; so that the nobles had it in their power to revenge their own quarrels, while the weak were equally exposed to the insults of both parties. The lord and his vassals, therefore, were always formidable; but the allodial proprietors had scarce any means of defending themselves. The reason of this was, in the first place, that the law did not allow them to commit any hostilities; and in the next, they were too distant and unconnected to form any proper league for mutual defence; and hence proceeded the necessity of converting allodial property into feudal tenure. This was indeed owing in a great measure to the absurdity and violence of the times, by which gifts of property, burthened with service, and which might return to the person who granted them, were rendered superior in value to the absolute and unconditional possession of a subject. Other considerations, however, besides that just mentioned, contributed to produce the same effect. As in those dark ages no right existed but what had its origin in conquest, it thence followed, that the greatest conqueror or warrior was the most honourable. The king, therefore, in whom the whole exploits of the community centred, as being their head, was the most honourable person; all others derived from him that portion of honour which they enjoyed, and which was most nicely adjusted in proportion as they approached him. Allodial proprietors having no pretentions of this kind, were treated with contempt as a kind of poltroons. From this disagreeable situation they wished to free themselves, by converting their allodial property into feudal tenures; while the princes, supposing it their interest to extend those tenures as much as possible, discouraged the allodial possessions. As the feodalists supported the importance of the nation and dignity of the monarch, it was not thought proper to allow the allodial proprietors any greater compensations than what were given to vassals in similar cases. Thus they were exposed to continual mortifications in the courts of justice; they were neglected by the king; denied sufficient protection from the laws; exposed not only to continual insults, but to have their property on all occasions destroyed by the great; so that they were without resource except from the feodal tenures, and were obliged even to solicit the privileges which were bestowed in other cases on vassals. In these unhappy circumstances, they were glad to yield up their lands to any superior whom they thought most agreeable, and to receive them back from them as a feudal gift. Thus the landed property was every where changed into feudal tenures, and fiefs became universal.

There have been several doubts and difficulties among the learned respecting the period at which the feudal laws were introduced into England: the generally received opinion, however, is, that they were introduced by William the conqueror. That monarch, at the head of victorious troops, having to do with two nations at enmity with each other, lying under a reciprocal check, and equally subdued by a sense of their unfortunate resistance, found himself in the most favourable circumstances for becoming absolute; and his laws, being promulgated, as it were, in the midst of thunder and lightning, imposed the yoke of despotism both on the victors and the vanquished. He divided England into 60,215 military fiefs, all held of the crown; the possessors of which were, on pain of forfeiture, to take up arms, and repair to his standard on the first signal. And the feodal system, being thus suddenly and violently introduced, took a more rigorous form than in other countries; the barons as well as the common people were subjected under it; and the whole was pressed together by the immense weight of the regal authority.

From the first institution of military service, a fine had been accepted instead of actual appearance in the field. In the times of barbarity, however, when men accounted rapine and bloodshed their only glory, there were but few who made an offer of this compensation; but as wealth and luxury increased, and the manners of people became softer, a general unwillingness of following the army into the field became also prevalent. A new tenure, called escuage, was therefore introduced; by which the vassal was only obliged to pay his superior a sum of money annually instead of attending him into the field. Hence originated taxes and their misapplication; for as the king was lord paramount of the whole kingdom, it thence happened that the whole escuage money collected throughout the nation centred in him. The princes then, instead of recruiting their armies, frequently filled their coffers with the money, or dissipated it otherwise, hiring mercenaries to defend their territories when threatened with any danger. These being composed of the dregs of the people, and disbanded at the end of every campaign, filled all Europe with a disorderly banditti, who frequently proved very dangerous to society. To avoid such inconveniencies, standing armies were introduced, and taxations began to be raised in every European kingdom. New inconveniencies arose. The sovereigns in most of these kingdoms, having acquired the right of taxation, as well as the command of the military power, became completely despotic: but in England the sovereign was deprived of this right by Magna Charta, which was extorted from him, as related in our English histories; so that, though allowed to command his armies, he could only pay them by the voluntary contributions of the people, or their submitting to such taxations as were virtually imposed by themselves.

FEODARY. *s.* (from *feodum*, Latin,) One who holds his estate under the tenure of suit and service to a superior lord (*Hanmer*).

To FEOFF. *v. a.* (*feoffare*, low Lat.) To put in possession; to invest with right.

FEOFFEE. *s.* (*feoffatus*, Lat. *fiefé*, Fr.) One put in possession (*Spenser*).

FEOFFER. *s.* (*feoffator*, low Latin.) One who gives possession of any thing.

FEOFFMENT, in law, (from the verb *feoffare* or *infeudare*, to give one a feud); the gift or grant of any corporeal hereditament to another. He that so gives, or enfeoffs, is called the feoffer; and the person enfeoffed is denominated the feoffee. This is plainly derived from, or is indeed itself the very mode of the ancient feodal donation; for though it may be performed by the word enfeoff, or grant, yet the aptest word of feoffment is *do* or *dedi*. And it is still directed and governed by the same feodal rules; insomuch that the principal rule relating to the extent and effect of the feodal grant, *tenor est qui legem dat feudo*, is in other words become the maxim of our law with relation to feoffments, *modus legem dat donationi*. And therefore, as in pure feodal donations, the lord from whom the feud moved must expressly limit and declare the continuance or quantity of estate which he meant to confer, *ne quis plus donasse præsumatur, quam in donatione expresserit*; so, if one grants by feoffment lands or tenements to another, and limits or expresses no estate, the grantee (due ceremonies of law being performed) hath barely an estate for life. For, as the personal abilities of the feoffee were originally presumed to be the immediate or principal inducements to the feoffment, the feoffee's estate ought to be confined to his person, and subsist only for his life; unless the feoffer, by express provision in the creation and constitution of the estate, hath given in a longer continuance. These express provisions are indeed generally made; for this was for ages the only conveyance, whereby our ancestors were wont to create an estate in fee-simple, by giving the land to the feoffee, to hold to him and his heirs for ever; though it serves equally well to convey any other estate of freehold. But by the mere words of the deed the feoffment is by no means perfected: there remains a very material ceremony to be performed, called livery of seisin; without which the feoffee has but a mere estate at will. See Seisin.

FERABAD, a town of Persia, capital of the province of Mazanderan, seated among the mountains which bound the Caspian sea to the S. and 12 miles from it. Shah-Abbas often spent his winters here. It is 139 miles W. of Astrabad. Lon. 52. 21 E. Lat. 37. 14 N.

FERA'CITY. *s.* (*feracitas*, Lat.) Fruitfulness; fertility.

FERÆ, in zoology, an order of the class mammalia; thus originally characterised: Fore-teeth conic, usually six in each jaw; tusks longer than the other teeth; grinders with conic projections; feet with claws; claws subulate; food carcases, and other animals attacked while alive.

FE'RAL. *a.* (*feralis*, Lat.) Funereal; deadly.

FERALIA, in antiquity, the same as Febrica. It continued for 11 days, during which time presents were carried to the graves of the deceased, marriages were forbidden, and the temples of the gods were shut.

FER DE FOURCHETTE, in heraldry, a cross having at each end a forked iron, like that formerly used by soldiers to rest their musquets on. It differs from the cross fourché, the ends of which turn forked, whereas this has that sort of fork fixed upon the square end.

FERE, a town of France, in the department of Aisne, famous for its powder-mill, and school of artillery. Near this town is the castle of St. Gobin, famous for its manufacture of fine plate-glass. Lat. 49. 29 N. Lon. 5. 25 E.

FERENTARII, in Roman antiquity, auxiliary troops, lightly armed.

FERENTINUM, in ancient geography, a town of the Hernici in Latium, which the Romans, after subduing that nation, allowed to be governed by its own laws. Now Ferentino, an episcopal city in the Campania of Rome. Lon. 14. 5 E. Lat. 41. 45 N.

FERENTUM, or Forentum, in ancient geography, a town of Apulia, in Italy. Now Forenza, in the Basilicata of Naples.

FERETRUM, among the Romans, the bier used in carrying out the bodies of the dead.

FERG, or Fergire (Francis Paul), an eminent landscape painter, born at Vienna in 1689. He studied under Hans Graaf and Grient, and possessing a fine taste he soon acquired an excellence in his art, which was also greatly improved by travelling. From Germany he came to London, where his talents were greatly admired, but an imprudent marriage rendered him incapable of profiting sufficiently by them. It is said that he was found dead at the door of his lodging, exhausted by cold, want, and wretchedness, in 1740. He adorned his landscapes with ruins executed in a grand taste. He also painted conversation-pieces admirably well. (*Watkins*).

FERGUSON (James), an ingenious experimental philosopher and mechanic, was born in Bamffshire, in Scotland, in 1710, and when young was placed out as a servant to a shepherd, in which situation he acquired an exact knowledge of the stars, and discovered so promising a genius, that some gentlemen of the neighbourhood kindly assisted him, and enabled him to follow his favourite studies. He made a wooden clock, and afterwards a watch, only by examining one of each. He also acquired a knowledge of drawing, and maintained himself and family by painting portraits, which profession he followed both in Scotland and England. About 1744 he went to London, where his uncommon abilities procured him many friends, and the honour of being admitted a fellow of the Royal Society. His present majesty, on his accession, settled upon him a pension of 50*l.* a year, and used often to converse with him upon philosophical and mechanical subjects. This ingenious man died in 1776. He invented several useful instruments, and published some excellent books; as, 1. Select Mechanical Exercises, 8vo.; 2. Introduction to Electricity, 8vo.; 3. Introduction to Astronomy, 8vo.; 4. Astronomy explained on sir Isaac Newton's Principles, 8vo.; 5. Lectures on Mechanics, Hydrostatics, Hydraulics, Pneumatics, and Optics, 8vo.; 6. A Treatise on Perspective, 8vo. A new edition of the Select Lectures on Mechanics, &c. has been lately published by Dr. David Brewster, with many valuable additions.

To what a degree of consideration Mr. Ferguson mounted by the strength of his natural genius, almost every one knows. He was by many considered as at the head of practical mechanics in this nation of philosophers. And he might justly be styled self-taught, or rather heaven-taught; for in his whole life he had not above half a year's instruction at school. He was a man of the clearest judgment, and the most unwearied application to study; benevolent, meek, and innocent in his manners as a child; humble, courteous, and communicative. Instead of pedantry, philosophy seemed to produce in him only diffidence and urbanity, a love for mankind and for his Maker. His whole life was an example of resignation and Christian piety. He might be said to be an enthusiast in his love of God, if religion, founded on such substantial and enlightened grounds as his was, could be styled enthusiasm.

FERIA, in the Roman breviary, is applied to the several days of the week; thus, Monday is the feria secunda; Tuesday the feria tertia; though these days are not working days, but holidays.

FERIÆ LATINÆ, festivals at Rome, instituted by Tarquin the Proud. The feriæ among the Romans were certain days set apart to celebrate festivals, and during that time it was unlawful for any person to work. They were either public or private. The public were of four different kinds, and were called stativæ, or immoveable; conceptivæ, or moveable; latinæ, compitaliæ, imperativæ, appointed only by the consul, dictator, &c. Nundinæ and privatæ. (For a minute description of the several kinds of feriæ, the student is referred to Kennet's Antiquities.) The days on which the feriæ were observed, were called by the Romans festi dies, because dedicated to mirth, relaxation, and festivity.

FERIA'TIO. *s.* (*feriatio*, Latin.) The act of keeping holiday.

FERINE. (*ferinus*, *morbus*, savage or brutal.) A term occasionally applied to any malignant or noxious disease.

FERI'NENESS. *s.* (from *ferine.*) Barbarity; savageness; wildness (*Hale*).

FE'RITY. *s.* (*feritas*, Latin.) Barbarity; cruelty; wildness; savageness (*Woodward*).

FERLINGATA TERRÆ, in our old writers, according to Du Cange, 40 perches of land.

FERMAT (Peter), counsellor of the parliament of Toulouse, in France, who flourished in the 17th century, and died in 1663. He was a general scholar, and a universal genius, cultivating jurisprudence, poetry, and mathematics, but especially the latter, for his amusement. He was contemporary and intimately connected with Mersenne, Torricelli, Des Cartes, Pascal, Roberval, Huygens, Frenicle, and Carcavi, and several others the most celebrated philosophers of their time. He was a first-rate mathematician, and possessed the finest taste for pure and genuine geometry, which he contributed greatly to improve, as well as algebra.

Fermat was author of, 1. A Method for the Quadrature of all Sorts of Parabolas. 2. Another on Maximums: which serves not only for the determination of plane and solid problems; but for drawing tangents to curve lines, finding the centres of gravity in solids, and the solution of questions concerning numbers: in short a method very similar to the Fluxions of Newton. 3. An Introduction to Geometric Loci, plane and solid. 4. A Treatise on Spherical Tangencies: where he demonstrates in the solids the same things as Vieta demonstrated in planes. 5. A Restoration of Apollonius's two books on Plane Loci. 6. A General Method for the Dimension of Curve Lines. Besides a number of other smaller pieces, and many letters to learned men; several of which are to be found in his Opera Varia Mathematica, printed at Toulouse, in folio, 1679. (*Hutton's Dict.*)

FERME, in the manage, implies an exercise on the same spot, without quitting or deviating from it.

FERMENAGH, or FERMANAGH, a county of Ireland, in the province of Ulster, 38 miles long and 23 broad. It is bounded by Donegal, Tyrone, Monaghan, Cavan, and Leitrim; it contains 19 parishes, and before the union sent four members to parliament. Inniskilling is the capital.

To FERME'NT. *v. a.* (*fermento*, Latin.) To exalt or rarify by intestine motion of parts (*Pope*).

To FERME'NT. *v. n.* To have the parts put into intestine motion.

FERME'NT. *s.* (*ferment*, Fr. *fermentum*, Latin.) 1. That which causes intestine motion (*Floy.*). 2. Intestine motion; tumult (*Rogers*).

FERME'NTABLE. *a.* (from *ferment.*) Capable of fermentation.

FERME'NTAL. *a.* (from *ferment.*) Having the power to cause fermentation (*Brown*).

FERMENTATION. (*fermentatio*, Latin. εκϐρασμος, Greek.) An intestine motion, excited by the assistance of proper heat and fluidity between the integrant and constituent parts of farinaceous, saccharine, and a few other substances, from which new combinations of their respective principles result.

The usual heat requisite for fermentation is about 70 deg. of Fahrenheit; and the usual substances employed for the purpose are sugar and farinaceous materials; the latter as possessing a considerable portion of the saccharine principle; this portion, however, is seldom sufficient in the farinaceous materials to enable them to ferment without some previous preparation. The preparation consists in wetting and in exposing the grain to a degree of warmth to excite the process of vegetation; but no new saccharine principle is added: it is merely more completely developed. Sugar must be employed in every fermentation; but it requires about four times its weight of water. With the sugar, mucilage is also requisite; an ingredient which the coarse sugar usually contains. But it is singular, that a vegetable acid must also be previously contained in the substance to be fermented (Annales de Chimie, xxxvi. 20.); and this we shall find to be supplied, in beer, by the barm or yeast, and is contained naturally in all the fruits.

When these ingredients are in due proportion, and the temperature raised to nearly 70°, an intestine motion commences; the liquor becomes thick and muddy; an additional degree of heat is excited in proportion to the rapidity of the process, which sometimes rises so high as 95°, and carbonic acid gas arises. In this process the sugar disappears, and the fluid becomes clear, as well as of a less specific gravity; and, as it is styled, of a vinous taste, owing to the formation of alcohol. The other ingredients seem merely to have assisted the process, and to remain unchanged; for we still find the mucilage both in wine and beer, and the vegetable acid in the former; though the small portion employed as a ferment in the latter seems to have escaped with the carbonic acid gas. Thus the sugar appears to be in part decomposed, and to have separated in the form of carbonic acid gas; and the other part, with a large excess of hydrogen, forms the alcohol, combined with the colouring matter, and the vegetable acid. The superfluous extractive matter, which the vinous liquor cannot dissolve, rises to the top, or sinks to the bottom, in proportion to the quantity of air entangled with it. In this process a portion of malic acid is formed, perhaps from the tartarous; and some oxygen is seemingly evolved. It was supposed that the latter was derived from the open air; but Fabroni has informed us, that fermentation proceeds with equal rapidity and success in close and in open vessels. Annales de Chimie, xxvi. 302.

After this active process of fermentation is at an end, it still proceeds in a more slow, often in an imperceptible, way. If wine or beer be kept in a heat, from 70 to 90 degrees, it gradually thickens, grows hot with a gently hissing noise, and filaments are observed to move in it, though previously fine. The heat and noise lessen; the filaments subside, and the liquor is again clear; but it is no longer vinous; it is acid. The result of the acetous fermentation seems not to be connected with the alcohol. Yet if the assertions of some of the older chemists, that the strongest wines, when rendered acid, afford the strongest vinegars, be true, alcohol may probably have some effect. These vinegars have not, however, been examined; and we strongly suspect that they would appear to have been impregnated with acetous ether. The extractive matter seems to be the substance which first experiences the change; for when it is carefully separated, wine will not become sour, though found by Chaptal to become acid, when vine leaves were added. (Annales de Chimie, xxxvi. 245.). It is said also, with some truth, that fermented liquors do not become acid, unless they are exposed to the atmosphere, from whence the oxygen, essential to the acidity, is absorbed. There seem, however, to be some cases in which this exposure to the atmosphere is not necessary; for wine will not become sour in well-corked bottles. In general, however, no cork is sufficiently tight to prevent, after some time, the escape of alcohol; and the atmospheric air finds access by the same course: in bottles which contain acid wine, some space will always be found empty, and the acidity is in proportion to this space. The flakes are owing to the extractive matter which commenced the process; but some portion of this still remains, and the malic acid is the last to experience the change.

The first signs of fermentation are a gentle intestine motion, the rising of small bubbles to the top of the liquor, and a whitish turbid appearance. This is soon followed by the collection of a froth or head, consisting of an infinite number of air bubbles entangled in the liquor, which, as the process advances, rise slowly to a considerable height, forming a white dense permanent froth. A very large portion of the gas also escapes, which has always a strong, agreeable, penetrating vinous smell. The temperature of the liquor at the same time increases several degrees above the external air; and continues so during the whole of the process. Sooner or later these appearances gradually subside; the head of foam settles into a dense froth, and on turning it aside, the liquor beneath appears much clearer, and nearly at rest, having deposited a copious sediment, and from being clammy and saccharine to the taste, it is now vinous and intoxicating, thinner and of less specific gravity.

The process, however, does not stop suddenly, but goes off very gradually, the liquor continuing to work or throw up foam, to clarify, to attenuate, to increase in intoxicating power, and more completely to lose all its sugar, which at last can now no longer be discerned by the taste, or detected by chemical analysis. The vinous liquor when complete, if of sufficient strength, and well fermented, will now keep for an indefinite time in vessels secured from air, and undergoes comparatively little further alteration, except in becoming more perfectly limpid by the deposition of an additional quantity of sediment.

The nature of the gas of fermenting liquors has long been known to consist for the most part of carbonic acid; and therefore it will extinguish candles, destroy animal life, convert alkalies into alkaline carbonats, and the like. But it is not simply carbonic acid that is given off, for it has been found by Scheele to hold in solution a sensible portion of alcohol, and by Proust to contain a quantity of azot. Mr. Collier has also found that the gas contains all the materials requisite for vinous fermentation. For this, he passed the whole gas from a ninety-gallon fermenting tun through a cask of water, and divided the water, thus impregnated, into three parts, the first of which was immediately distilled, and gave a small quantity of spirit; to the second was added some yeast, by which a new fermentation was excited, and the subsequent product of distilled spirit was almost doubled; and the third, being suffered to remain longer, produced some vinegar.

The attenuation of liquors by fermentation, or the diminution of their specific gravity, is very striking. This is commonly seen by the hydrometer, which swims much deeper in fermented liquor than in the same materials before fermentation. Most of this attenuation is doubtless owing both to the destruction of the sugar, which dissolved in water adds to its density, and to the consequent production of alcohol, which, on the contrary, by mixture with water, lessens its density. The extract or mucilage also appears to be in some degree destroyed by fermentation, for the gelatinous consistence of thick liquors is much lessened thereby, though this quality, as far as it depends on mucilaginous extract, is not so completely lost as the saccharine material; many of the full-bodied ales, for example, retaining much of their original clamminess and gelatinous density.

It has been doubted whether alcohol exists ready formed in vinous liquors, or whether it is not then in some intermediate state, and is brought to a perfect spirit by the boiling heat required for distillation. It is not easy to devise any unexceptionable mode of determining this question. Fabbroni argues in favour of alcohol being a product, and not an educt from wine; that wine cannot be again formed by adding the distilled alcohol to the residue; and also that if a small portion of alcohol is added to wine, it may be separated again almost entirely by carbonat of potash (with which alcohol will not unite), but this salt will not separate any alcohol from wine in its natural state. This last fact, however, only shews, that the union of the alcoholic with the other part of the wine is too strong to be broken by simple affinity without the assistance of heat; and as to the former, it is highly probable that the boiling heat operates some change on the other constituents of wine, the effect of which can never be done away by the mere return of the spirit which has been driven off. This opinion, therefore, though by no means improbable, wants further confirmation.

Alcohol is not immediately formed in fermenting liquors, as it does not appear till the fermentation is complete, for the liquor distilled in the early stage of the process will not yield a drop of spirit. The external air seems to have no chemical effect whatever in the process of vinous fermentation, as it may be conducted full as well in close as in open vessels, always allowing room for the great expansion of the materials, and the vast production of gas. M. Collier has also found, by direct experiment, that more spirit is produced by close than by open fermentation. In three separate experiments, in each of which equal quantities of wort and yeast were fermented, under circumstances precisely similar, with the single exception, that in one the vessel was open and in the other it was closed (having no exit but through a tube dipping in water) he found, that on distilling each fermented liquor, and obtaining the same quantity of spirit from each, that belonging to the close fermenting vessels was constantly of a less specific gravity, and consequently contained more alcohol than the other. Where the spirit from the open vessel was 74 degrees below proof, that from the closed vessel was 56: where the former was 83, the latter was 65; and where 103, the other was 93.

The theory of vinous fermentation is still involved in extreme difficulty, on account of the very compound nature of all the substances employed in it, and their great tendency to decomposition in a variety of methods.

The results of the experiments of Lavoisier should not pass unnoticed, though it is obvious that much too great simplicity is attempted in the explanation of a process, which every circumstance shows to be very complicated. It is some advantage, however, that the action of the external air, so necessary to be considered in most decompositions of vegetable matter, may here be entirely put out of the question. The simple point to which Lavoisier's experiments tend, is (setting aside all other agents) to explain how sugar becomes converted into carbonic acid and alcohol, which, after all, is the great phenomenon of vinous fermentation. The entire products of sugar, yeast, and water, fermented in close vessels, are stated to be carbonic acid, alcohol, and water, chiefly, together with a small quantity of acetous acid and part of the materials undecomposed. We shall not enumerate the exact composition given by this eminent chemist of all the ingredients and products of fermentation, nor enlarge on the many sources of inaccuracy which may be pointed out, but the theory suggested by the author from these experiments is the following: Sugar is a compound of about 8 of hydrogen. 64 of oxygen, and 28 of carbon, and the process of fermentation effects a change, merely in the arrangement of the constituent parts of the sugar, converting one portion into carbonic acid, and the other into alcohol: and hence, as the carbonic acid contains only carbon with a large proportion of oxygen, the portion which is left must contain all the hydrogen, now concentrated into a much smaller compass, part of the carbon, and only the small remaining portion of oxygen. Or, in other words, by this new arrangement of the ingredients of the sugar, one portion (namely, the carbonic acid) is totally deprived of hydrogen, and overloaded with oxygen; and consequently the other portion (which is the alcohol) abounds in hydrogen, and is deficient in oxygen. The carbon is nearly equally divided between the two products relatively to their quantity.

Perhaps no more plausible theory has yet been offered of the general phenomenon of vinous fermentation, though it is so extremely defective in essential parts, and even not corresponding with the alleged composition of alcohol, given by the same chemist in another part of his inquiries, that it can only be regarded as an ingenious and happy conjecture. The great question still remains for future inquirers to determine: what is it that causes sugar to ferment? for it has been proved, that sugar will not of itself begin this spontaneous change into carbonic acid and alcohol, though when once begun, probably the process will go on without further assistance. It has been already mentioned, that both extractive matter and an acid are present in every known instance of vinous fermentation, and for any thing that appears to the contrary, both of them are necessary, though the requisite quantity of each is very small, compared to the sugar; therefore, the strength or body of the fermented liquor is in direct proportion to the quantity of sugar alone (the fermentation having been complete), and there is strong reason to suppose, that the extractive matter and the acid are only accessary ingredients, but still essential, or those without which the vinous decomposition of sugar cannot be effected.

It has been supposed, that it is the vegeto-animal extract, as it has been called, which exists in the fermentable juices of vegetables, that causes the first change in the sugar. The precise nature of this vegeto-animal matter is not very well known; it may be supposed to be similar to the gluten of wheat, but most intimately combined with the vegetable saccharine mucilage, and hence extremely susceptible of spontaneous change. The chief, if not the only proof of its existence, in many of these combinations, is the production of a quantity of ammonia when decomposed by heat; which alkali is almost uniformly formed by the action of fire, and indicates, in the recent vegetable, the existence of azot. It may, therefore, be more properly termed the azotic than the vegeto-animal ingredient, and as mentioned under the article **Bread**, it seems to be peculiarly requisite to the panary fermentation, and to perform the most important part in this process.

Some of the commonest fermenting materials, such as wort of malt, or the infusion of the soluble part of barley, rendered saccharine by previous decomposition, it is well known will hardly enter into fermentation without yeast; and hence, chemists have sought in this substance for the principle which gives the first impulse to the fermentation of sugar. The analysis of yeast presents a vast variety of ingredients, the chief of which are the carbonic, acetic, and malic acids, mucilage, sugar, and gluten. Of these, the latter is in the largest proportion, which would seem to give much weight to the opinion of the great share which the azotic ingredient has in inducing fermentation.

Yet Mr. Henry found, by a series of very interesting experiments, that malt infusion might be made to enter into complete fermentation, simply by impregnating it with carbonic acid from chalk and sulphuric acid; and the liquor, thus fermented, gave a yeast, which made perfect bread, gave alcohol by distillation, and vinegar by further keeping. Undoubtedly the wort itself contained all the ingredients of yeast, since this substance was produced during the fermentation; but the experiment is decisive to prove, that no addition of azotic extract is required to begin fermentation in materials naturally fermentable; though, when once begun, the yeast, as fast as it was produced, must have assisted in the fermentation then going on. The evidence for the necessity of an acid to begin fermentation is therefore more decisive; but it is still doubtful what particular acid is required, or whether several will answer the purpose.

In Mr. Henry's experiments, the acid was the carbonic, and, from the arrangement of the apparatus, probably a small portion of the sulphuric was also carried in along with it. But in grape juice no evidence can be given of the existence of the carbonic acid ready formed, though the tartaric and malic, and other vegetable acids, contain within themselves the two ingredients of carbonic acid; and it is well known, that they are chiefly and ultimately resolvable into the carbonic. Yeast will even induce fermentation after it is pressed and dried into solid cakes (a practice not uncommon, as it will keep a great length of time in this form), but after this operation, it can hardly contain an atom of carbonic acid ready formed, though with abundant tendency to produce it by the first mutual action of its other constituent parts. Many interesting inquiries, therefore, remain to be carried on, before we can have a full and satisfactory theory of this most important process of vinous fermentation.

FERMENTATION IN THE LIVING ANIMAL. In a certain sense of the term fermentation, it may be said to take place in the stomach during digestion, and even amongst the circulating fluids. We meet at least with an assimilating process, by which, when a poisonous matter is introduced into the system, it is increased in quantity, a part of the healthy fluids being apparently converted into the nature of the morbid substance, and rendered capable of propagating the same poison, with an equal increment, by being introduced, no matter in how small a quantity, into the healthy fluids of another person.

To this extent the doctrine of a fermentative assimilation must be admitted by every medical practitioner. But the older schools of medicine appear to have carried the doctrine too far, when they contemplated the process which takes place in the living subject, as precisely the same as takes place by chemical agency between inanimate materials. In this last case, the whole mass exposed to the fermenting process is equally and alike converted into a third substance; but in the living body, we hear of no instance in which all the fluids, or even the whole of any particular description of fluids, are transformed into a new compound. There is, nevertheless, a degree of mystery still existing in this subject that we cannot develop; and that calls for much diffidence and modesty in our mode of treating it. The doctrine of the old schools has certainly been favoured in no inconsiderable degree by the discoveries of modern chemists.

FERMENTATION is a term which has also been lately applied to mineral as well as to animal and vegetable matter: for it is by a process, which he denominates fermentation, that Mr. Parkinson endeavours to account for the conversion of vegetable materials into turfa and bitumen, especially into coal. *Organic Remains of a former World.*

FERME'NTATIVE. *a.* (from *ferment.*) Causing fermentation (*Arbuthnot*).

FERMO, an ancient town of the March of Ancona, in Italy. It belongs to the pope, and is the see of an archbishop. Lat. 43. 7 N. Lon. 13. 50 E.

FERN-MALE. See FILIX.

FERN-FEMALE. See FILIX FŒMINA.

FERNS. See FILICES.

FERNANDES. See JUAN FERNANDES.

FE'RNY. *a.* (from *fern.*) Overgrown with fern (*Dryden*).

FERO'CIOUS. *a.* (*ferox*, Lat. *feroce*, Fr.) 1. Savage; fierce (*Pope*). 2. Ravenous; rapacious (*Brown*).

FERO'CITY. *s.* (*ferocitas*, Lat. *ferocité*, Fr.) Savageness; wildness; fierceness (*Addison*).

FERONIA, the pagan goddess of woods and orchards. This deity took her name from the town Feronia, situated at the foot of mount Soracte in Italy, where were a wood and temple consecrated to her. That town and wood are mentioned by Virgil, in the catalogue of Turnus's forces. Strabo relates, that those who sacrificed to this goddess walked barefoot upon burning coals, without being hurt. She was the guardian of freed-men, who received their cap of liberty in her temple.

FERO'NIA. Elephant apple-tree. In botany, a genus of the class decandria; order monogynia. Calyx five-parted; petals five; berry globular, covered with a hard, rough, woody shell, one-celled; seeds numerous. One species; an East-India tree with a few irregular branches and single thorns; flowers panicled; fruit large, juicy, and pleasant to the taste.

FERRARA, (the ancient *Forum alieni*), a city of Italy, capital of a duchy of the same name, with a bishop's see, and an university. It was formerly a fine and flourishing place; but the present inhabitants are few in proportion to its extent, and bear every mark of poverty. They retain, however, an old privilege of wearing swords by their sides, which extends to the lowest mechanics; and fencing is the only science in a flourishing condition in this town, which furnishes all Italy with skilful fencing-masters. Formerly here was a noted manufactory of sword-blades. In the Benedictine church, Ariosto the poet is interred. Lat. 44. 54 N. Long. 11. 41 E.

FERRARA, or the FERRARESE, a province of Italy, in the territory of the church; bounded on the N. by the Polesino di Rovigno, on the W. by the duchy of Mantua, on the S. by the Bolognese and Romagna, and on the E. by the gulf of Venice. It had its own dukes till 1597, when pope Clement VIII. united it to the apostolic chamber.

FERRARI (Octavian), an Italian writer of the 16th century, born of a noble family at Milan, in 1518. He became professor first at Padua, and afterwards at Milan, where he taught philosophy till his death, in 1586. He wrote, 1. De Sermonibus Exotericis, Venice, 1575; 2. De Origine Romanorum, 1607. He also translated Athenæus into Latin.

FERRA'RIA, in botany, a genus of the class monadelphia; order triandria. Spathe two-leaved; calyxless; petals six, the three outer ones broader; style one; capsule three-celled, inferior. Four species: natives of the Cape; Mexico; Australasia. It is a curious circumstance in one or two of these plants, that their roots vegetate only once every two or three years; appearing in the intermediate space to be torpid or somnolent.

FERREO'LA, in botany, a genus of the class diœcia; order pentandria. Calyx three-cleft; corol three-cleft. Male; filaments inserted into a semi-globular receptacle. Fem.; style one; germ oval; berry two-seeded. One species; a Coromandel tree, the trunk of which is covered with a ferruginous bark; leaves oval, entire.

FE'RREOUS. *a.* (*ferreus*, Lat.) Irony; partaking of iron (*Brown*).

FERRET, in mastiology. See MUSTELA.

To FE'RRET. *v. a.* (from the noun.) To drive out of lurking places (*Heylin*).

FE'RRETER. *s.* (from *ferret.*) One that hunts another in his privacies.

FERRETS, among glass-makers, the iron with which the workmen try the melted metal, to see if it be fit to work.

FERRI CARBONAS, Carbonate of Iron, the name introduced into the new pharmacopœia of the London College, to supply the late name of RUBIGO FERRI, which see.

FERRI LI'MATU'RA PURIFICA'TA. Steel filings possess tonic, astringent, and deobstruent virtues, and are calculated to relieve chlorosis and other diseases in which steel is indicated, where crudity in the primæ viæ abounds.

FERRI RUBI'GO. See RUBIGO FERRI.

FERRI SULPHAS. The name of the FERRUM VITRIOLATUM of the new pharmacopœia. See FERRUM VITRIOLATUM.

FERRI (Ciro), a skilful painter, born of a good family at Rome, in 1634. He was bred under Peter Cortona; and the works of the scholar are often mistaken for those of the master. The great duke of Tuscany nominated him chief of the Florentine school; and he was as good an architect as a painter. He died in 1689.

FE'RRIAGE. *s.* (from *ferry.*) The fare paid at a ferrry.

FERRO, or HIERO, one of the Canary isles, remarkable for this circumstance, that several geographers have reckoned their first meridian from its westernmost extremity. It is a dry and barren spot, affording no water except what is supplied in a surprising manner, by the fountain-tree, which grows in this island, and distils water from its leaves, in such plenty as to answer all the purposes of its inhabitants. According to the requisite tables, the latitude is 27. 47. 20 N. and Lon. 17. 45. 50 W. of Greenwich.

FERROL, a town of Spain, in Galicia, with a famous harbour, not only one of the best in Spain, but as many assert, of all Europe. Here the vessels lie safe from all winds. Lat. 43. 30 N. Lon. 8. 4 W.

FERRU'GINOUS. *a.* (*ferrugineus*, Latin.) Partaking of the particles and qualities of iron (*Ray*).

FERRUGO, rust or oxide of iron. See OXIDE.

FE'RRULA, Fennel-giant. In botany, a genus of the class pentandria; order digynia. Fruit oval, flat-compressed, with three raised lines on both sides. Twelve species; all herbaceous perennials, rising about ten feet high, generally with yellow flowers: for the most part natives of the South of Europe and the Levant. The only one worth noticing is F. asa fetida, a native of Persia, with alternately sinuate and obtuse leaflets; the concrete juice of which is the asa fetida of the shops.

FE'RRULE. *s.* (from *ferrum*, iron, Latin.) An iron ring put round any thing to keep it from cracking (*Ray*).

FERRUM. Iron; for the medical properties of which, see IRON. In mineralogy, a genus of the class metals. Blueish-grey, easily rusting in the air, very hard, tenacious and elastic, sonorous, exceedingly malleable, ductile, attracted by the magnet, and itself convertible into a magnetic substance: specific gravity 7,778; becoming white in the fire, then emitting brilliant sparks, and at last melting; forming a red oxyd, when its filings are kept red hot in an open vessel and stirred; soluble in all acids, giving them an astringent taste; and yielding a black colour when mixed with vegetable astringents; precipitating a green powder, when dissolved in sulphuric acid, and mixed with potass; with the Prussic acid forming a rich azure blue.

This most useful of all metals, the continual attendant on man in all his states of social existence, which gives tools to the labourer and mechanic, arms to the soldier, to the sailor his compass, to the scholar his penknife and his ink, so easily unites with other substances, and dissolves in menstrua of almost every description, that it is rarely if ever found in an uncombined and native state; yet as it has occasionally been so discovered, although it is uncertain whether such specimens may not more properly belong to the meteoric kind, as they all contain nickel, we have added native iron to the other species of this metal, which will then afford us thirty-four: of which the chief are as follows:

1. F. nativum. Native iron. Uncombined, malleable. Found in masses in America; but possibly meteoric: yet Kirwan thinks it has unquestionably been detected in an original state at Eibenstork, in Sweden, and in the mountain of Grand-Gilbert in Dauphigny.

2. F. meteoricum. Meteoric iron Amorphous; of a granular texture; externally covered with a black scoriaceous crust, internally ashy-grey, mixed with minute shining particles; falling from the atmosphere. Found at Wold Cottage in Yorkshire, in Scotland, various parts of continental Europe, especially Siberia, in Asia and America, where the masses have been deposited by the bursting of meteors. These masses when they first fall from the atmosphere are said to be hot, and their descent is affirmed to be accompanied with a loud explosion or hissing noise. They are found of various magnitudes, from a few ounces, to several tons in weight: the outer surface is rough and indented, and covered with a thin black crust, as if it were burnt; internally they are of a fine granular texture, which may be easily crumbled to pieces by the nail; of an ashy-grey colour, intermixed with small shining yellow particles, and discovering an earthy smell: they are slightly magnetic, and sometimes exhibit fine veins of iron: spe-

cific gravity from 3,352 to 4,281. A piece of the Yorkshire stone in 150 parts contained

Silica	75
Magnesia	37
Oxyd of iron	48
Oxyd of nickel	2
	162

the excess of 12 proceeding from the absorption of oxygen during the process of analysation.

The production of these meteoric stones, as they are commonly called, in the upper regions, has been variously conjectured: but we are to this hour totally ignorant upon the subject. All that has hitherto been offered being conjecture, and nothing more. Their descent from the skies was at one time denied; but the frequency of such descent in all parts of the world, as well as in all ages, as high as to the æras of Aristotle and Anaxagoras, both of whom have characteristically described them, has subverted all incredulity in the present day; and left us to account for their formation in the best manner we are able. M. M. Humboldt, Parkin, and Izarn suppose them to consist of the elementary particles either of the substances that feed volcanos, or of all bodies whatever volatilized and reduced to extreme division, by the medium of hydrogenous gass, inflaming in the upper regions of the atmosphere, and hereby re-uniting their primary corpuscles, and thus acquiring an increased magnitude of weight, which produces their descent. The greater number of the French philosophers, however, conceive that these bodies are thrown from some enormous volcanos in the moon, by the common law of projectiles—and M. La Place has entered into a regular series of calculations, to prove that such volcanos as we apprehend to exist in the lunar sphere, may possess a projectile force capable of producing such effect. While M. Chladni conjectures again, that these bodies are dependent for their formation neither upon the earth nor the moon, but are formed from substances exterior to the atmospheres of both, substances which have never incorporated with them, and are found loose in the vast ocean of space, consistently with the Epicurean theory. For a more particular but compressed account of the different theories and reasonings upon this subject we refer the reader to the notes on GOOD's translation of Lucretius, vol. I. p. 194, and 414. See also our article AEROLITHS.

3. F. chalybeum. Attracted by the magnet, reducible to grains; black, with a black streak, of a compact texture, and common form, found at the base of the mountain Urdjumski, in Siberia, and in the mines of Sweden: strikes fire with steel, and is malleable after fusion: contains from 50 to 60 per cent. of good iron, which is convertible into the best kind of steel, and a little sulphur.

4 F. selectum. Common iron ore: magnetic iron ore. Attracted by the magnet, reducible to grains, black, with a black streak, of a very fine granular texture, and common form. Found in most of the iron mines of Europe and America, and yields a considerable proportion of good iron.

5. F. commune. This is also called common iron ore. Attracted by the magnet, reducible to grains, black, with a black streak, of a coarser granular texture than the last, and of common form. There are five other varieties:

β mixed with arenaceous particles.
γ mixed particles of steatite interspersed.
δ mixed calcareous particles.
ε interspersed with red micaceous spots.
ζ mixed with particles of pyrite.

Found in most countries containing mines of iron; and is subject to many varieties; contains a large quantity of ore, and some sulphur.

6. F. crystallinum. Magnetic iron stone: octahedral iron ore. Attracted by the magnet, black, with a black streak, in the form of crystals. Found in various parts of Great Britain, Norway, Sweden, Germany, Corsica, generally strongly attached to their matrix.

7. F. glareosum. Magnetic sand. Attracted by the magnet, black, with a black streak, in the form of sand. Found in Italy, at the base of volcanic mountains, in the rivers, and on the shores of Great Britain, Siberia, Greenland, Bohemia, Jamaica and India; and probably the fragments of other ores washed down and comminuted by torrents and the waves of the sea.

8. F. Magnes. Magnet: Loadstone. Magnetic, compact, of a common form. Found in the mines of Denmark, Sweden, Norway, Lapland, Siberia, Bohemia and Peru, in masses, plates, grains, or eight-sided crystals; and often contains above 70 per cent. of iron.

9. F. basalticum. Columnar iron ore. Magnetic, brownish-red, formed of slender columns adhering to each other, and which are generally incurved. Found in Bohemia, Franconia, &c. generally in large strata: slightly stains the fingers, sounds hollow when struck.

10. F. micaceum. Micaceous iron ore: brown, scaly, iron ore: foliated oxyd of iron. Not magnetic, iron-grey, shining, of a lamellar texture. Found in Wales, Scotland, Cornwall, &c. in Siberia, Lapland, Sweden, Hungary, and other parts of Europe; massive, or disseminated, variously grouped, or crystallized, in small six-sided tables.

11. F. speculare. Specular iron ore: crystallized oxyd of iron. Not magnetic, compact, of a steel grey colour, and lustre, with a red streak, internally specular. Four varieties, and found in the mines of Lancashire, in the isle of Elba, Germany, France, Russia, massive, disseminated or crystallized, the surface often tarnished, and exhibiting various iridescent colours.

12. F. rubricosum. Red scaly iron ore: red iron glimmer: ochraceous iron. Not magnetic, red lamellar, shining internally, very soft, greasy to the touch, and staining the fingers; of a common form. Found in Wales, Sweden, Saxony, Hungary, most frequently incumbent upon other ores and minerals.

13. F. hæmatites: not magnetic, fibrous, hardish, opake, with a red or yellow streak. Four varieties:

α Black iron ore.
β Brown hæmatite; or muriated oxyd of iron.
γ Blood-stone: red hæmatite.
δ Yellow hæmatite.

Found in various parts of England and Scotland, particularly in Lancashire; in Russia, Siberia, and other parts of the continent; massive, disseminated, nodular, botryoidal, tabular, cellular, tubular, or stalactitical.

14. F. compactum. Solid hæmatite. Compact red iron ore. Not magnetic, compact, opake, with a red or yellow streak. Found in Lancashire, Siberia, Saxony, Bohemia.

15. F. spatosum. Pearl-spar. Sparry iron ore. Not magnetic, lamellar, effervescing with acids, crackling and blackening before the blow-pipe, breaking into rhomboidal fragments. Found in various parts of Great Britain and the European continent; massive or disseminated, or in small crystals.

16. F. siliceum. Sinople. Not magnetic, striking fire with steel. Found in the mines of Hungary, and the Harz, and sometimes contains, with hornstone, quartz and jasper, a small portion of gold.

17. F. argillaceum. Argillaceous iron ore. Soft, opake, without lustre, dry. Found in various parts of Great Britain, in Italy, Saxony, Germany, Bohemia; in detached lumps, or forming strata, fistular, cellular, or variously imitative.

18. F. ochra. Iron ochre: red ochre: red crayon. Not magnetic, without lustre, opake, friable. Found in every country abounding in iron ore; sometimes in water impregnated with iron: streak red or yellow; it adheres to the tongue, stains strongly, and is principally employed in drawing or writing.

19. F. cœruleum. Blue iron earth: azure iron ore. Not magnetic, friable, earthy, without lustre, becoming blue by exposure to the air, and brownish in the fire, changing its colours in a solution of soda. Found in many parts of England and Scotland, Siberia, Sweden, Norway, Poland, Germany, &c.; in marshy grounds, at various depths, generally in an earthy state, and without any regular shape, adhering to the stones and pebbles which surround it. By Klaproth it is considered as a phosphat of iron.

20. F. subaquosum. Lowland iron ore: Bog iron ore. Not magnetic, without lustre, opake, of a dull colour, humid. Found in Great Britain, and various parts of Europe, in low swampy situtions, stagnant lakes or brooks, &c.; sometimes massive, but commonly in detached lumps of various shapes, as placentiform, flat, sounded, granular, or pisiform, generally perforated, fistular or spongy: when globular or kidney-shaped it is called *Eagle stone*.

21. F. viride. Green iron earth: green martial earth. Of a green colour, shining, dissolving in acids, with difficulty friable. Found at Schneeburg in a matrix of quartz and clay, compact, solid, or like a corroded stone, oftener inverting or incumbent, and seldom indurated.

22. F. arsenicale. Arseniat of iron: arseniated iron ore. Grey or greenish, not magnetic, emitting arsenical vapours, when thrown on red hot coals. Found in the copper mines of Cornwall, and in Spain, in small pieces, or generally crystallised in cubes.

23. F. sulphuratum. Sulphuret of iron: iron pyrite. Opake, emitting sulphureous flames and vapours, when thrown on hot coals. This species must again be brought forward, under the article SULPHUR, which see.

24. F. phlogisticum. Bituminous iron ore. Opake, of a dusky colour, inflammable. Found in Hungary and Sweden; in external appearance resembling a piece of coal; texture rather friable, or rather firm or fixed. It quickly kindles, and burns with a light flame, losing something of its weight.

FERRUM AMMONIACA'TUM. In the late pharmacopœia, F. Ammoniacale. Flores martiales. Flores salis ammoniaci martiales. Ens martis. Ens veneris Boylei. Murias ammoniacæ ferratus. Sal mortis muriaticum sublimatum. Sal ammoniacum martiale. This preparation is the true ammoniacal muriat of iron, and therefore termed murias ferri ammoniacalis in the new chemical nomenclature. It is exhibited in chlorosis, asthenia, menorrhagia, intermittent fevers, and most cases of debility.

FERRUM TARTARISA'TUM. Tartarus chalybeatus. Mars solubilis. Ferrum potabile. This preparation of iron is called tartaris potasse acidulus ferratus in the new chemical nomenclature. Its virtues are astringent and tonic, and it forms in solution an excellent tonic fomentation to contusions, lacerations, distortions, &c.

FERRUM VITRIOLA'TUM. Vitriolum martis. Vitriolum ferri. Vitriolum viride. Sal martis. Green vitriol. This is an excellent preparation of iron, and is exhibited in many diseases as a styptic, tonic, astringent, and antihelmentic. In the new chemical nomenclature it is called sulphas ferri, it being a sulphate of iron.

To FE'RRY. *v. a.* (ꝼiꞃan, to pass, Saxon.) To carry over in a boat (*Spenser*).

To FE'RRY. *v. n.* To pass over water in a vessel of carriage (*Milton*).

FE'RRY. FERRYBOAT. *s.* (from the verb, and *boat.*) 1. A vessel of carriage (*Shakspeare*). 2. The passage over which the ferryboat passes.

FE'RRYMAN. *s.* (*ferry* and *man.*) One who keeps a ferry; one who for hire transports goods and passengers over the water (*Shakspeare*).

FERTE-ALAIS, a town of France, in the department of Seine and Oise, 18 miles S. of Paris. Lon. 2. 27 E. Lat. 48. 30 N.

FERTE-BERNARD, a town of France, in the department of Sarte, seated on the Huisne, 20 miles N.E. of Mans. Lon. 0. 39 E. Lat. 48. 8 N.

FERTH, or FORTH. Common terminations, are the same as in English an army; coming from the Saxon word ꝼẏꞃð (*Gibson*).

FE'RTILE. *a.* (*fertile*, Fr. *fertilis*, Lat.) Fruitful; abundant; plenteous (*Dryden*).

FE'RTILENESS. *s.* Fruitfulness; fecundity.

To **FERTI'LITATE.** *v. a.* (from *fertile.*) To fecundate; to fertilize: not in use (*Brown*).

FERTI'LITY. *s.* (*fertilitas*, Latin.) Fecundity; abundance; fruitfulness (*Raleigh*).

To **FE'RTILIZE.** *v. a.* (*fertiliser*, French.) To make fruitful; to make plenteous; to make productive; to fecundate (*Woodward*).

FE'RTILY. *ad.* (from *fertile.*) Fruitfully; plenteously; abundantly.

FE'RVENCY. *s.* (*fervens*, Latin.) 1. Heat of mind; ardour; eagerness (*Shaksp*). 2. Pious ardour; zeal (*Hooker*).

FE'RVENT. *a.* (*fervens*, Latin.) 1. Hot; boiling (*Wotton*). 2. Hot in temper, vehement (*Hooker*). 3. Ardent in piety; warm in zeal (*Acts*).

FE'RVENTLY. *ad.* (from *fervent.*) 1. Eagerly; vehemently (*Spenser*). 2. With pious ardour (*Colossians*).

FE'RVID. *a.* (*fervidus*, Latin). 1. Hot; burning; boiling. 2. vehement; eager; zealous.

FERVI'DITY. *s.* (from *fervid.*) 1. Heat. 2. zeal; passion; ardour.

FE'RVIDNESS. *s.* (from *fervid.*) Ardour of mind; zeal; passion (*Bentley*).

FERULA, in the ancient Eastern church, signified a place separated from the church, wherein the audientes were kept, as not being allowed to enter the church; whence the name of the place, the persons therein being under penance or discipline. This word was sometimes used to denote the prelate's crozier or staff.

Ferula, a little wooden pallet or slice, reputed the schoolmaster's sceptre, wherewith he chastises the boys, by striking them on the palm of the hand. The word is Latin, and has been also used to denote the prelate's crosier and staff. It is supposed to be formed of the Latin *ferire*, to strike. Under the eastern empire, the ferula was the emperor's sceptre, as is seen on divers medals; it consists of a long stem or shank, and a flat square head.

Ferula, in botany. See **Ferrula**.

Fe'rula assa fætida. The systematic name of the assafœtida plant. See **Assafætida.**

To **FE'RULE.** *v. a.* To chastise with a ferula.

FE'RVOUR. *s.* (*fervor*, Lat. *ferveur*, Fr.) 1. Heat; warmth (*Waller*). 2. Heat of mind; zeal (*Hooker*). 3. Ardour of piety (*Addison*).

FESCENNINA, the name given to the first nuptial songs, because they originated with the people of Fescennia, a city of Etruria.

FE'SCUE. *s.* (*festu*, French.) A small wire by which those who teach to read point out the letters (*Holder*).

FE'SELS. *s.* A kind of base grain (*May*).

FESSE. *s.* (In heraldry.) The fesse is so called of the Latin word fascia, a band or girdle, possessing the third part of the escutcheon over the middle (*Peacham.*)

To **FE'STER.** *v. n.* To rankle; to corrupt; to grow virulent (*Sidney*).

FESTI DIES. See **Feriæ latinæ.**

FE'STINATE. *a.* (*festinatus*, Latin.) Hasty; hurried: not in use (*Shakspeare*).

FE'STINATELY. *ad.* Hastily (*Shakspeare*).

FESTINA'TION. *s.* (*festinatio*, Latin.) Haste.

FE'STIVAL. *a.* (*festivus*, Lat.) Pertaining to feasts; joyous (*Atterbury*).

Fe'stival. *s.* Time of feast; anniversary day of civil or religious joy (*Sandys*).

FE'STIVE. *a.* (*festivus*, Latin.) Joyous; gay; befitting a feast (*Thomson*).

FESTI'VITY. *s.* (*festivitas*, Latin.) 1. Festival; time of rejoicing (*South*). 2. Gaiety; joyfulness (*Taylor*).

FESTOON, in architecture and sculpture, &c. an ornament in form of a garland of flowers, fruits and leaves, intermixed or twisted together. It is in the form of a string or collar, much the widest in the middle, where it falls down in an arch; being extended by the two ends, the extremities of which hang down perpendicularly.

FESTU'CA. Fescue-grass. In botany, a genus of the class triandria; order digynia. Calyx two-valved; spiklet oblong, rounded, with pointed glumes. Twenty-seven species. Some few with an equal panicle, the rest with a panicle pointing one way. The species are largely scattered over the globe; and about twelve of them are common to the pastures, woods, mountains or old walls of our own country.

FESTUCINE, in mineralogy, of a shivery or splintery fracture.

Festu'cine. *a.* (*festuca*, Lat.) Straw-colour; between green and yellow (*Brown*).

FESTU'COUS. *a.* (*festuca*, Latin.) Formed of straw (*Brown*).

To **FET.** *v. a.* To fetch: not in use (*Spenser*).

Fet. *s.* A piece: not in use (*Drayton*).

To **FETCH.** *v. a.* pret. fetched. (feccan, Sax.) 1. To go and bring (*Waller*). 2. To derive; to draw (*Shakspeare*). 3. To strike at a distance (*Bacon*). 4. To bring to any state by some powerful operation (*Addison*). 5. To draw within any confinement or prohibition (*Sanderson*). 6. To produce by some kind of force (*Add*). 7. To perform any excursion (*Knolles*). 8. To perform with suddenness or violence (*Addison*). 9. To reach; to arrive at (*Chapman*). 10. To obtain as its price (*Locke*).

To **Fetch.** *v. n.* To move with a quick return (*Shakspeare*).

Fetch. *s.* (from the verb.) A stratagem by which any thing is indirectly performed; a trick; an artifice (*Hudibras*).

FE'TCHER. *s.* (from *to fetch.*) One that fetches any thing.

FETHARD, a borough of Ireland, in the county of Tipperary, eight miles S.E. of Cashel, and 80 S.S.W. of Dublin.

Fethard, a town of Ireland, in the county of Wexford, on the coast, 81 miles S. of Dublin. Lon. 7. 3 W. Lat. 52. 10 N.

FETID. *a.* (*fœtidus*, Latin.) Stinking; having a smell strong and offensive (*Arbuthnot*).

FETIDNESS. *s.* The quality of stinking.

FET-LOCK. (q. d. *feet-lock.*) The lock or tuft of hair that grows behind the pastern-joint of a horse: whence the joint itself is called the fetlock joint, as well as the pastern-joint. Horses of a low size have scarcely any such tuft; but some species of draft horses have very large fetlocks, and so much hair that if care be not taken to keep them clean, they will soon become subject to grease and other ulcers. See GREASE.

FETOR. *s.* (*fœtor*, Latin.) A stink; a stench; a strong and offensive smell (*Arbuthnot*).

FETTER. *s.* It is commonly used in the plural, fetters. (from feet; ꝼeꞇꞇeꞃe, Saxon.) Chains for the feet (*Raleigh*).

To FE'TTER. *v. a.* (from the noun.) To enchain; to shackle; to tie (*Bramhall*).

FETTI (Domenico), an eminent painter in the style of Julio Romano, was born at Rome in 1589, and educated under Ludovico Civoli in Florence. He painted but little for churches, but excelled in history; his pictures are much sought after, and are scarce. He abandoned himself to disorderly courses; and put an end to his life, by excesses, in the 35th year of his age.

To FETTLE. *v. n.* To do trifling business.

FETUS. See FŒTUS.

FEUD, in our ancient customs, a capital quarrel or enmity, not to be satisfied but with the death of the enemy; and thence called *deadly feud*.

FEUD, *feoda*, the same with Fief, or Fee. See FEODAL SYSTEM.

FEUDATORY, or FEODATORY, a tenant who formerly held by feodal service.

FEVER, in medicine. See FEBRIS.

FEVER-FEW, in botany. See MATRICARIA.

To FE'VER. *v. a.* (from the noun.) To put into a fever (*Shakspeare*).

FE'VERET. *s.* (from *fever.*) A slight fever; febricula (*Ayliffe*).

FE'VERISH. *a.* (from *fever.*) 1. Diseased with a fever (*Creech*). 2. Tending to a fever (*Swift*). 3. Uncertain; inconstant; now hot, now cold (*Dryden*). 4. Hot; burning (*Dryden*).

FE'VERISHNESS. *s.* (from *feverish.*) A slight disorder of the feverish kind.

FE'VEROUS. *s.* (*fievérieux-se*, French.) 1. Troubled with a fever or ague (*Shaksp.*). 2. Having the nature of a fever (*Milton*). 3. Having a tendency to produce fevers (*Bacon*).

FEVERSHAM, a seaport in Kent, on a creek of the Medway, much frequented by small vessels. It is a member of the port of Dover, and is governed by a mayor. Here are markets on Wednesdays and Saturdays. In the neighbourhood are several gunpowder-mills. Here also are the remains of a stately abbey, built by king Stephen, who was interred in it with his queen and son. Lat. 51. 22° N. Lon. 0. 55 E.

FE'VERY. *a.* (from *fever.*) Diseased with a fever (*Ben Jonson*).

FEUILLAGE. *s.* (French). A bunch or row of leaves (*Jervas*).

FEUILLEMORT. *s.* (French.) The colour of a faded leaf, corrupted commonly to philemot.

FEUILLEE (Louis), a French naturalist, born in Provence, in 1660. Louis XIV. sent him into various countries, and at his return granted him a pension. He died in 1732. He wrote a Journal of Observations, physical, mathematical, and botanical, made on the Coasts of South America and New Spain, 3 vols. 4to.

FEUILLIA. In botany, a genus of the class diœcia, order pentandria. Calyx five-cleft; corol five-cleft; nectary five convergent filaments. Fem.: styles three; pome hard. Three-celled, covered with a bark. Two species: one of the East and the other of the West Indies; both herbaceous and scandent.

FEVRE (Claude), a French painter, who excelled in painting portraits, though he did also flowers and historical subjects very well. He died in London in 1675, aged 42.

FEVRE (Nicholas le), or Faber, a learned man, born at Paris in 1544. While a student he met with a strange misfortune; for as he was cutting a pen, a piece of the quill flew into his eye, and gave him such intolerable pain, that in a fit of agony he thrust the knife into his eye and cut it out. In 1587 he published Seneca with notes. Henry IV. appointed him preceptor to the prince of Condé, and after the death of that monarch, he became tutor to Lewis XIII. He died in 1611. His works, which are not numerous, were printed at Paris at 1614, 4to. (*Watkins*).

FEVRE (Roland le), a painter, commonly called le Fevre of Venice, but born in Anjou. He painted portraits and naked figures, and had a curious method of staining marble. He died in England in 1677.

FEVRE (Tannegui le), or Tanaquil Faber, father of Madame Dacier, was born at Caen in Normandy, in 1615. His reputation for learning, even in his youth, was so great, that Cardinal Richelieu settled upon him a pension of 2000 livres, to inspect the books that were printed at the Louvre. On the death of the cardinal his salary was stopped. Some years afterwards he removed to Saumur, and became a professor there, having embraced the reformed religion. Here he had a great number of scholars, who afterwards proved ornaments to the world of letters. He died in 1672. His son, who was a protestant minister, but afterwards turned Roman catholic, published a tract, intituled, De futilitate Poeticis, 1697. T. le Fevre published; 1. Luciani de morte Peregrini libellus, cum notis, 1653, 4to. 2. Diatribe, Flavii Josephi de Jesu Christo Testimonium suppositum esse, 1655, 8vo. 3. Epistolarum. 4. Several French translations from the ancients. 5. A Method of Education, &c.

FE'UTERER. *s.* A dog-keeper.

FEW. *a.* (ꝼeo, Saxon.) 1. Not many; not numerous (*Berkley*). 2. *In few.* In not many words (*Hooker*).

FE'WEL. *s.* (*feu*, Fr.) Combustible matter; as firewood, coal (*Bentley*).

To Fe'wel. *v. n.* (from the noun.) To feed with fewel (*Cowley*).

FE'WNESS. *s.* (from *few.*) 1. Paucity; smallness of number (*Dryden*). 2. Paucity of words; brevity (*Shakspeare*).

To **FEY.** *v. a.* (*veghen*, Dutch.) To cleanse a ditch of mud (*Tusser*).

FEZ, a kingdom of Barbary, 125 miles in length and breadth; bounded on the W. by the Atlantic Ocean, on the N. by the Mediterranean Sea, on the E. by Algiers, and on the S. by Morocco and Tafilet. The air is temperate and wholesome, and the country full of mountains, particularly to the W. and S. where Mount Atlas lies; but it is populous and fertile, producing citrons, lemons, oranges, dates, almonds, olives, figs, raisins, sugar, honey, flax, cotton, pitch and corn in abundance. The inhabitants breed camels, beeves, sheep, and the finest horses in Barbary.

Fez, the capital of the kingdom of Fez, is not only ancient, but one of the largest and most handsome cities in Africa. It is composed of three towns, called Beleyde, Old Fez, and New Fez. Old Fez is the most considerable, and contains about 80,000 inhabitants. The palaces are magnificent, and there are 700 mosques, 50 of which are very considerable, adorned with marble pillars and other ornaments. The houses are built of brick or stone, and adorned with Mosaic work: those of brick are ornamented with glazing and colours, like Dutch tiles, and the wood-work and ceilings are carved, painted, and gilt. There is a court to every house, in which are square marble basons. The roofs are flat, and they sleep thereon in the summer. Here are two colleges for students, finely built of marble and adorned with paintings: one of those has 100 rooms, and the sides are adorned with marble pillars of various colours, whose capitals are gilt, and the roof glitters with gold, azure, and purple. Here are many hospitals, and above 100 public baths, many of which are stately structures. All the trades live in a separate part of the city, and the exchange, full of all sorts of rich merchandise, is itself as large as a small town. The gardens are beautiful, and full of all kinds of fragrant flowers and shrubs, so that the city in general is a sort of terrestrial paradise. The inhabitants are clothed like the Turks, and the ladies dress very expensively in the winter; but in the summer, they wear nothing but a shift. It is the centre of the trade of this empire, and hence caravans go to Mecca, carrying with them ready-made garments, Cordovan leather, indigo, cochineal, and ostrich feathers, for which they bring in return, silks, muslins, and drugs. Other caravans go to Tombuctoo, and the river Niger; one of which consists of 20,000 men. They travel over such dry barren deserts, that every other camel carries water. Their commodities are salt, cowries, wrought silk, British cloth, and the woollen manufactures of Barbary. Here are a great number of Jews, who have handsome synagogues; but the bulk of the inhabitants are Moors, of a tawny complexion; there are also a great number of blacks. Lat. 33. 40 N. Lon. 5. 5 W.

FEZZAN, a country of Africa, situate to the south of Tripoli, and sixty days journies west from Cairo. It contains, according to the report of travellers, 28 towns and 100 villages. The chief productions are dates and senna. The natives are of a deep swarthy complexion, with short, curly, black hair, thick lips, flat noses, &c.; though on the whole tall and well shaped. Their dress is similar to that of the Moors of Barbary. In their common intercourse, all distinctions of rank seem forgotten. The Fezzaner is generous and hospitable, and whether his fare be scanty or abundant, he is desirous that others should partake of it. Gold dust constitutes their chief medium of payment, and value in that medium is always expressed by weight. In religion they are rigid, but not intolerant Mahometans. The government is monarchical, and its powers are administered with such regard to the happiness and welfare of the people, that they are ardently attached to their sovereign, and indeed to one another. Mourzook is the capital.

FIASCONE, an episcopal town of Italy, in the territory of the church. It is noted for fine Muscadine wine. Lat. 42. 34 N. Lon. 12. 13 E.

FIAT, in law, is used for a short order or warrant of some judge for making out and allowing certain processes. Thus, if a certiorari be taking out in vacation, and tested of the precedent term, the fiat for it must be signed by a judge of the court, some time before the essoign day of the subsequent term, otherwise it will be irregular. There is no need for the judge to sign the certiorari itself, but only where it is required by statute.

Fiat justitia, is an order granted on a petition to the king for his warrant to bring a writ of error in parliament, in which case he writes on the top of the petition fiat justitia, Let justice be done; and then the writ of error is made out, &c.

FIATOLA, in ichthyology. See Stromateus.

FIB. *s.* A lie; a falsehood (*Pope*).

To Fib. *v. n.* To lie; to tell lies (*Arbuthnot*).

FI'BBER. *s.* A teller of fibs.

FIBEB. (*fiber*, from *fiber*, extreme, because it resides in the extremities of lakes and rivers.) The beaver. The female beaver. *Castor fiber* of Linneus. It has two excretory follicles near the anus, filled with an unctuous substance called castor. See Castoreum.

FIBRE ANIMAL. Muscular fibre or flesh; a compound substance, the base of which is fibrin, a material peculiar to this kind of organic structure, but which is always more or less united with other substances.

A variety of chemical experiments have

lately been made to investigate the general nature of flesh or animal fibre, and to ascertain the relative proportions of the various materials that compose it. The best experiments are those of Reaumur, Geoffrey, Thouvenel, Fourcroy and Hatchett. The experiments of the two last are mostly entitled to attention, and especially those of Mr. Hatchett; who has not only availed himself of every antecedent fact of importance, but has very largely contributed to the general number of facts.

Mr. Hatchett's researches have been chiefly directed to the muscular fibre of beef; in prosecuting which, with a view of separating the liquid albuminous part in lymph, as much as possible, a quantity of lean muscle of fat beef was cut into small thin pieces, then macerated during fifteen days in cold water, and afterward subjected to pressure during each day, when the water was changed. The weather was very cold, and the maceration continued to the end of the fifteenth day, without any sign of putrescency. The shreds of muscle (amounting to about three pounds) were then boiled with about six quarts of water, during five hours; and the water being changed, the same was repeated every day during the course of three weeks; at the end of which, the water afforded only slight signs of gelatin, when infusion of oak bark, or nitro muriat of tin, was added. After this, the fibrous part was well pressed and dried by the heat of a water-bath.

Some of the muscular fibre thus prepared was steeped in nitric acid, diluted with three measures of water during fifteen days. The acid acquired a yellow tinge, and possessed all the properties of the nitric solutions of albumen.

The fibre, which had been thus steeped in the acid, was (when washed) dissolved by boiling water, and by evaporation became a gelatinous mass; which being again dissolved in boiling water, was precipitated by infusion of oak bark, and more slowly by nitro muriat of tin, like albuminous substances, when treated in a similar manner. When the fibre, which had been steeped in the acid, was immersed in ammonia, it was not completely dissolved, and afforded a residuum. The greater part, however, was dissolved, and formed a deep orange or yellowish brown solution, similar in properties to that of albumen. When boiled with lixivium of caustic potash, this muscular fibre was completely dissolved, ammonia was discharged, and animal soap formed, which being diluted with water, and saturated with muriatic acid, yielded a precipitate similar to that obtained from animal soap, except that it sooner becomes hard and soapy when exposed to the air.

Muscular fibre, when prepared by long maceration, and subsequent boiling with frequent change of water, so as to be nearly deprived of all its gelatinous part, is not easily brought into a putrid state. A small quantity was kept moistened with water during April, in the course of which time, it acquired a musty, but not a putrid smell, neither were the fibres reduced to a pulpy mass; a portion of it was kept two months under water, but it neither became putrid, nor was converted into that fatty substance obtained from recent muscle. Hence Mr Hatchett is of opinion, that the readiness with which muscle becomes putrid is principally owing to the gelatin, which is mixed with it in large proportion, and which, with the natural quantity of moisture, is requisite to give the fibre a proper degree of toughness and flexibility.

The residuum afforded by muscular fibre, which had been long steeped in dilute nitric acid, and afterward immersed in ammonia, consisted principally of fat, mixed with a small portion of the fibre which had not been sufficiently acted upon by the acid, and little or no earthy matter was thus obtained. But when the prepared muscular fibre was dissolved in boiling nitric acid, a complete solution, resembling that of albumen in its general properties, was formed, and some fat floated in drops at the top of the liquor. Ammonia was then added, so as to supersaturate the acid, and produced the same effects as on the nitric solutions of albumen, excepting that a copious white precipitate was obtained. This precipitate, while moist, was agitated with a quantity of acetous acid, which dissolved, and separated a small portion of phosphat of lime; but the remainder and by much the greatest part of this precipitate was scarcely attacked, even when the acid was boiled.

When exposed to a red heat, it becomes dark grey, and then nearly white; after which it was in the state of carbonat of lime.

Another part was dissolved in nitric acid, and lime was precipitated by carbonat of soda. The slight excess of the latter was then saturated by acetous acid, and the whole was boiled to expel the carbonic acid; after which the liquor from its effects on solutions of lime, barytes, &c. evidently contained oxalic acid in solution; the precipitate was therefore oxalat of lime mixed with a very small quantity of phosphat of lime; 200 grains of the dry muscular fibre, dissolved and boiled with a nitric acid, afforded 17 grains of this precipitate.

Although it is known that the gelatinous liquor obtained from muscle by boiling water contains phosphats of soda and of lime, yet Hatchett did not imagine the greater part of the latter could be so completely separated. He, therefore, in some measure, repeated the experiment on the muscle of veal, and found phosphats of soda and of lime in the liquor. But when the muscle was afterwards dissolved in boiling nitric acid, and the solution saturated with ammonia, he was surprised to find, although the same change in colour was produced as in all the former experiments, the liquor remained transparent, and even after several days, only a few scattered particles appeared at the bottom of the vessel.

Another experiment was made on the recent muscle of mutton, but this was immediately dissolved in nitric acid, without being previously boiled in water. The fat being separated, the solution was as before saturated with ammonia, and as usual became of a deep orange colour, or yellowish brown; in a few hours also, a small quantity of white precipitate subsided. This precipitate, however, was completely and readily soluble in acetous acid, and in every respect proved to be phosphat of lime.

This chemist observes, that the liquor from which the above precipitate was separated, as well as those afforded by the muscle of veal, by the prepared muscle of beef (as well as by the solutions of tortoiseshell and albumen) in boiling nitric acid, subsequently saturated with ammonia, all contained a considerable portion of uncombined oxalic acid, which was separated by the acetite of lime and of lead. But he did not find oxalic acid in the solutions formed by immersing the bodies, for a long time, in cold and dilute nitric acid; neither did he find oxalic acid in solutions made by dissolving the substances in boiling muriatic acid. It is evident, therefore, that the oxalic acid, observed in the above experiments, was a product of the operations, and not an educt of the substances.

Hatchett concludes, from the experiments upon the above muscular substances, that they contain lime in various proportions, and in two different states, viz. carbonat and phosphat, and that the greater part of the latter is gradually separated, in conjunction with the gelatin, by means of boiling water. Not that the phosphat of lime is an essential ingredient in gelatinous substances, on the contrary, isinglass, which is a perfectly gelatinous body, affords but a mere visible trace of it. The muscular fibre of beef appears to have been nearly deprived of its phosphat of lime, by the long continued and repeated boiling in water to which it had been subjected; but still so large a quantity of lime remained, that when oxalic acid was formed by the action of the boiling nitric acid, it combined with lime and formed an oxalat amounting to 19 grains from 200 grains of the dry muscular fibre, dissolved in nitric acid, and precipitated by ammonia. He does not know what quantity of lime was separated with the gelatin; but from the quantity of lime remaining, and which afterwards combined with oxalic acid, the muscle of beef must contain a considerable portion of earthy matter; and as by the experiment on the muscle of veal, scarcely any precipitate was obtained after it had been boiled, and as but a small portion of phosphat of lime was present in the gelatinous liquid, it appears, that in this muscle, the whole of the small portion of lime it contained was in the state of phosphat; and this being nearly separated, there did not remain any part of uncombined lime or carbonat of lime, which by uniting with the oxalic acid (subsequently produced) would form an oxalat; and as lime in the states of phosphat and carbonat is so much more abundant in the muscle of beef than in that of veal, it may be inferred that the earthy matter is more abundant in the coarse and rigid fibre of adult and aged animals, than in the tender fibre of young ones; and this seems to be corroborated by the tendency to morbid ossification, so frequently observed in aged individuals of the human species. Five hundred grains of the dry prepared muscular fibre of beef, when distilled, left 108 grains of coal, which, by incineration, afforded 25,60 grains of earthy residuum; the coal may therefore be estimated at 82,40 grains. The greatest part of these 25,60 grains was carbonat of lime mixed with some pure lime and a small portion of phosphat; and there can be no doubt but that the latter would have been more abundant, had it not been for the repeated boilings to which the muscular fibre had been subjected. The recent muscles of veal and mutton were, with great difficulty, reduced to ashes; for toward the end of the process, the ashes and remaining coal became coated and glazed with saline matter, which appeared to be soda, partly in the state of phosphat.

It appears, therefore, from the experiments already mentioned, that muscle or flesh consists of albumen, gelatin, fibrin, the phosphats of soda and of lime, muriat of soda, the zoonic acid, and iron; but a more exact analysis is necessary to ascertain its component parts with precision and certainty.

Fibre (Vegetable). Wood. Almost all plants contain a fibrous matter which is distinguished by its comparative insolubility in all chemical agents, indestructibility by spontaneous change, and by a certain toughness and elasticity produced by the strong intertexture of its minute threads. These fibres are sometimes highly flexible and firm; as the stringy stalk of the hemp plant, the aloe, the bark of the birch, and other trees that afford all the variety of matting. They exist with greater hardness and brittleness in the cane, but are still highly flexible and elastic; and with yet greater density and diminished flexibility they form the ligneous fibre or wood of the larger trees. The chemical analysis of vegetable fibre we shall give under the article Wood.

Fibre of a root, in botany, a thread or longitudinal canal, imbibing moisture from the earth. These fibres properly constitute the roots of vegetables: the main body, whence they usually proceed, is the descending trunk; and will, in many plants, become a trunk, if the plant be turned upside down.

A branch or subdivision of a fibre is called a fibril. Fibrilla.

FIBRIN, in chemistry, the fibrous matter of animals or vegetables: or rather the matter which chiefly constitutes such fibres, and upon which the peculiar power of such fibres depends.

This when pure is of a white colour and without smell or taste: it is very tenacious, and hence capable of elongation. It contains no iron on analysis; and as gelatine is more abundant in young animals, this is found more abundantly in old. The other three chief bases of animal matter are Albumen, Gelatin, and Osseous earth, which see under their respective heads.

It was till of late conceived that plants, though they possessed a fibrous structure, did not possess the peculiar matter of fibrin. In the juice of the papaw tree, however, that contains a very large portion of albuminous matter, fibrin has been fully detected by Vauquelin, which may hence rank as a vegetable as well as an animal matter.

When the juice of the papaw tree is treated with water the greater part dissolves; but there remains a substance insoluble, which has a greasy appearance. It softens in the air and becomes vivid, brown, and semi-transparent. When thrown on burning coals it melts, lets drops of grease exude, emits the noise of meat roasting, and produces a smoke which has the odour of fat volatilized. It leaves behind it no residue. This substance is fibrin. The resemblance between the juice of the papaw tree and animal matter is so close that one would be tempted to suspect some imposition, were not the evidence that it is really a vegetable juice quite unexceptionable.

The properties of fibrin are the following:

1. It is tasteless, fibrous, elastic, and resembles gluten.

2. It is indissoluble in water and in alkohol.

3. It is not dissolved by diluted alkalies.

4. It is dissolved without difficulty by acids.

5. With nitric acid it gives out much azotic gass

6. In distillation it yields much carbonat of ammonia and oil.

7. It soon putrifies when kept moist, becomes green, but does not acquire any resemblance to cheese. See Fibre.

FIBROLITE, a species of the topaz family, first observed by Bournon in the matrix of the imperfect corundum. Colour white, or dirty grey; hardness rather greater than that of quartz; specific gravity 3·214; texture fibrous; cross fracture compact; internal lustre glossy; infusible by the blow-pipe; usually in shapeless fragments. Bournon observed one specimen crystallized, in a rhomboidal prism; the angles of whose faces were 80° and 100°. It is composed, according to Chenevix, of 52·25 alumina, 38·00 silica, and 3·75 a trace of iron and loss.

FI'BRIL. *s.* (*fibrille*, French.) A small fibre or string (*Cheyne*).

FI'BROUS. *a.* (*fibreux*, French.) Composed of fibres or stamina (*Bacon*).

FIBULA. (*fibula, quasi figulula*, from *figo*, to fasten. So named because it joints together the tibia and the muscles.) A long bone of the leg, situated on the outer side of the tibia, and which forms, at its lower end, the outer ankle. Its upper extremity is formed into an irregular head, on the inside of which is a slightly concave articulating surface, which, in the recent subject, is covered with cartilage, and receives the circular flat surface described under the edge of the external cavity of the tibia. This articulation is surrounded by a capsular ligament, which is farther strengthened by other strong ligamentous fibres, so as to allow only a small motion backwards and forwards. Externally, the head of the fibula is rough and protuberant, serving for the attachment of ligaments, and for the insertion of the biceps, cruris muscle. Immediately below it, on its inner side, is a tubercle, from which a part of the gastrocnemus internus has its origin. Immediately below this head the body of the bone begins. It is of a triangular shape, and appears as if it were slightly twistd ate each end in a different direction. It is likewise a little curved inwards and forwards. This curvature is in part owing to the action of muscles: and in part perhaps to the carelessness of nurses. Of the three angles of the bone, that which is turned towards the tibia is the most prominent, and serves for the attachment of the interosseous ligament, which, in its structure and uses, resembles that of the fore-arm, and, like that, is a little interrupted above and below. The three surfaces of the bone are variously impressed by different muscles. About the middle of the posterior surface, is observed a passage for the medullary vessels, slanting downwards. The lower end of the fibula is formed into a spongy, oblong head, externally rough and convex, internally smooth, and covered with a thin cartilage, where it is received by the external triangular depression at the lower end of the tibia. This articulation, which resembles that of its upper extremity, is furnished with a capsular ligament, and farther strengthened by ligamentous fibres, which are stronger and more considerable than those we described above. They extend from the tibia to the fibula, in an oblique direction, and are more easily discernible before than behind. Below this the fibula is lengthened out, so as to form a considerable process, called malleolus externus, or the outer ancle. It is smooth, and covered with cartilage on the inside, where it is contiguous to the astragalus, or first bone of the foot. At the lower and inner part of this process there is a spongy cavity, filled with fat; and a little beyond this, posteriorly, is a cartilaginous groove, for the tendons of the peroneus longus and peroneus brevis, which are here bound down by the ligamentous fibres that are extended over them.

The principal uses of this bone seem to be, to afford origin and insertion to muscles, and to contribute to the articulation of the leg with the foot.

Fibulæ, buckles, clasps. This Latin word, generally taken, signifies all sorts of work that joints two things together.

Fibula architectonica, that which in architecture we call a nail, peg, key, and ring, and all that is made use of to join beams together, and other parts of building. In this sense Cæsar makes use of this word, in the description he has made of the bridge that he built over the river Rhine: Binis utrinque fibulis ab extremâ parte distinebantur.

Fibula, in relation to cloaths, means buckles and clasps, that keep close, or tie up some part of our cloaths. The Greeks and Romans made use of them, and often adorned them with precious stones. Men and women wore them upon their cloaths and shoes, and used them to keep up their hairs, aliqua fibula comam diffluentem colligans.

Fibula gymnastica, or **Citharæ, dica**, used only by musicians and comedians to keep close the prepuce of children, lest they should keep women-company, and lose their voice, as we learn of Celsus. The same thing was used to players upon the stage, to preserve their voice, as it is reported by Martial.

Menophili penem tam grandis fibula vestis.

FICA'RIA. (*ficaria*; from *ficus*, a fig, so called from its likeness.) The herb fig-wort.

FI'CHARD (John), an eminent lawyer of Frankfort-on-the-Maine, who died in 1581, aged 69. He wrote; 1. Virorum, qui superiori nostroque sæcula eruditiono et doctrina illustres atque memorabiles fuerunt, Vitæ, 4to. 2. Vitæ jurisconsultorum. 3. Onomasticon Philosophica Medica synonymem. 4. De Cautelis. 5. Concilium Marimoniale.

FICINUS (Marsilius), a famous Italian, born at Florence in 1453, and brought up at the expense of Lorenzo de Medicis, with whom he became a particular favourite. He was the first who restored the platonic philosophy in the west, to facilitate which he rendered the works of Plato and Plotinus into Latin. He died at Corregio in 1499. His writings are very numerous, and were collected and printed in 2 vols. folio, at Basil, in 1561 and 1576.

FI'CKLE. *a.* (ficol, Saxon.) 1. Changeable; inconstant; irresolute; wavering; unsteady (*Dryden*). 2. Not fixed; subject to vicissitude (*Milton*).

FI'CKLENESS. *s.* (from *fickle.*) Inconstancy; uncertainty; unsteadiness (*Sidney*).

FI'CKLY. *ad.* (from *fickle.*) Without certainty or stability (*Southern*).

FI'CO. *s.* (Ital.) An act of contempt done with the fingers (*Carew*).

FICOIDES, in botany. See MESEMBRYANTHEMUM.

FI'CTILE. *a.* (*fictilis*, Latin.) Manufactured by the potter (*Bacon*).

FI'CTION. *s.* (*fictio*, Latin.) 1. The act of feigning or inventing (*Stillingfleet*) 2. The thing feigned or invented (*Raleigh*). 3. A falsehood; a lie.

FI'CTIOUS. *a.* Fictitious; imaginary (*Prior*).

FICTI'TIOUS. *a.* (*fictitius*, Latin.) 1. Counterfeit; false; not genuine (*Dryden.*) 2. Feigned; imaginary (*Pope*). 3. Not real, not true; allegorical (*Addison*).

FICTI'TIOUSLY. *ad.* (from *fictitious.*) Falsely; counterfeitly (*Brown*).

FICUS. Fig-tree. In botany, a genus of the class polygamia; order triœcia; receptacle, common, turbinate, fleshy, connivent, covering and concealing the fructification in the same or a distinct plant. Male: calyx three-parted; corolless; stamens three. Female: calyx five-parted; corolless; pistil one; seed one, compressed. Fifty-six species. India; West Indies; South America, and Australasia. The most celebrated are as follow:

1. Ficus India. Banyan-tree, or Indian-fig. Leaves oblong, rounded at the base, smooth, entire, somewhat glaucous underneath, with impressed dots above: fruits nearly globular. This tree is the glory of the bramins, and is well entitled to their highest boastings. From the munificent display of its fruit, its astonishing longevity, or rather superiority to all decay, and its overspreading arms, they regard it as the best emblem of the deity, generally erect their pagodas in its vicinity, and pass their lives under its enormous shade.

2. F. sycomorus. Sycomore, or Sycamore. Leaves heart-shaped, roundish, very entire, downy underneath: fruit sessile. A large tree, fifty feet high, frequent in Lower Egypt: it buds in the end of March, and the fruit ripens in the beginning of June. It is cultivated in our own country.

3. F. carica. Common fig-tree. Leaves palmate, in about three lobes, rough underneath; fruit glabrous, pear-shaped, umbilicate It rises about fifteen or twenty feet, with an upright branching stem. The varieties are numerous, and for the most part produce ripe fruit in July and August. The chief varieties are, the large, oblong, dark, purplish-blue fig; the brown or chesnut; the green Ischia; brown Ischia; the Malta; the round brown Naples fig. The genus is a native of the south of Europe, and many of its varieties are cultivated in our own gardens. The maturation of the fruit is often accelerated by a very peculiar process called CAPRIFICATION, which we have already described under that term, and to which therefore we refer the reader.

All the branches of the banyan, when they have reached a certain height, incurve, and when they have in this manner bent down to the surface of the earth, pierce it with their tendrils, which from stem branches immediately become radicles or root-branches; in consequence of which the original tree is possessed at length of a vast multitude of enormous trunks, each increasing in diameter, and rivaling, or nearly so, the trunk from which they sprang. All these trunks are continually sending forth new branches which are again converted into new trunks sporting alike with time and space, for the trunks never die spontaneously, nor is there any limit to their spontaneous extent. The largest banyan known to Europeans is on an island in the river Nerbedda in the Guzzerat, distinguished, in honour of a bramin of high reputation, by the name of Cubbeer Burr. High floods have destroyed much of the extent of this tree; yet it measures round the principal stems two thousand feet in circumference; its largest trunks, each exceeding our noblest oaks, amount to three hundred and fifty; the smaller are more than three thousand; and it is said that seven thousand persons find ample room to repose under its shade. It is loaded in its season with an abundance of fruit, and is able to supply the same number of persons from the enormous quantity it produces.

FICUS. (*ficus.*) A fleshy excrescence about the anus, in figure resembling a fig.

FICUS CARICA, the systematic name of the fig-tree. See CARICA.

FID. *s.* (*fitta*, Italian.) A pointed iron with which seamen untwist their cords (*Skinner*).

FI'DDLE. *s.* (fiꝺele, Sax.) A stringed instrument of music; a violin (*Stillingfleet*).

To FI'DDLE. *v. n.* (from the noun.) 1. To play upon a fiddle (*Bacon*). 2. To trifle; to shift the hands often, and do nothing (*Arbuthnot*).

FI'DDLEFADDLE. *s.* (A cant word.) Trifles.

Fi'ddlefaddle. *a.* Trifling; giving needless trouble (*Arbuthnot*).

FI'DDLER. *s.* (from *fiddle.*) A musician; one that plays upon the fiddle (*Ben Jonson*).

FIDDLESHAPED, in botany. See Panduræform.

FI'DDLESTICK. *s.* (*fiddle* and *stick.*) The bow and hair which a fiddler draws over the strings of a fiddle (*Hudibras*).

FI'DDLESTRING. *s.* (*fiddle* and *string.*) The string of a fiddle. See Violin.

FIDE-JUSSOR, in the civil law, is a surety, or one that obliges himself in the same contract with a principal, for the greater security of the creditor or stipulator.

FIDEI-COMMISSUM, in Roman antiquity, an estate left in trust with any person, for the use of another. See Trustee.

FIDE'LITY. *s.* (*fidelitas*, Lat.) 1. Honesty; veracity (*Hooker*). 2. Faithful adherence (*Clarke*).

FIDES, Faith or Fidelity, one of the virtues deified by the Pagans. She had a temple near the capitol, founded by Numa Pompilius; but no animals were offered, or blood spilt, in her sacrifices. During the performance of her rites, her priests appeared in white vestments, with their heads and hands covered with linen, to shew that fidelity ought to be sacred.

To FIDGE. *To* Fi'dget. *v. n.* (A cant word.) To move nimbly and irregularly.

FIDICINALIS. (*fidicinalis, musculus.*) See Lumbricalis.

FIDICULÆ, in antiquity, the cords with which criminals were tied on the equuleus.

FIDU'CIAL. *a.* (*fiducia*, Lat.) Confident; undoubting (*Hammond*).

FIDU'CIARY. *s.* (*fiduciarius*, Latin.) 1. One who holds any thing in trust. 2. One who depends upon faith without works (*Hammond*).

Fidu'ciary. *a.* 1. Confident; steady; undoubting (*Wake*). 2. Not to be doubted (*Howel*).

FIEF, the same with feud.

FIELD, in antiquity. See Campus and Elysium.

Field. *s.* (ꝼelꝺ, Saxon.) 1. Ground not inhabited; nor built on (*Raleigh*). 2. Ground not enclosed (*Mortimer*). 3. Cultivated tract of ground (*Pope*). 4. The open country (*Shakspeare*). 5. The ground of battle (*Milton*) 6. A battle; campaign; the act of any army while it keeps the field (*Shakspeare*). 7. A wide expanse (*Dryden*). 8. Space; compass; extent (*Smallridge*). 9. The ground or black spot on which figures are drawn (*Dry.*). 10. (In heraldry.) The surface of a shield.

Fi'eld-bed. *s.* (*field* and *bed.*) A bed contrived to be set up easily in the field (*Shakspeare*).

Field-book, in surveying, a book used for setting down angles, distances, and other things remarkable in taking surveys.

The field-book is ruled into three columns. In the middle one are set down the distances on the chain line, at which any mark, offset, or other observation is made; and in the right and left hand columns are entered the offsets, angles, and observations made on the right and left hand respectively of the chain line.

It is of great advantage, both for brevity and perspicuity, in large surveys, to begin at the bottom of the leaf and write upwards; denoting the crossing of fences, by lines drawn across the middle column, or only a part of such a line on the right and left opposite the figures, to avoid confusion, and the corners of fields, and other remarkable turns in the fences where offsets are taken to, by lines joining in the manner the fences do.

Field-colours, in war, are small flags of about a foot and a half square, which are carried along with the quarter-master general, for marking out the ground for the squadrons and battalions to encamp on.

Field-fare, in ornithology. See Turdus.

Field-officer, in the art of war. See Officer.

Field of view, or of vision, is the whole space or extent within which objects can be seen through an optical machine, or at one view of the eye without turning it.

The precise limits of this space are not easily ascertained, for the natural view of the eye. In looking at a small distance, we have an imperfect glimpse of objects through almost the extent of a hemisphere, or at least for above 60 degrees each way from the optic axis; but towards the extremity of this space, objects are very imperfectly seen; and the diameter of the field of distinct vision does not subtend an angle of more than 5 degrees at most, so that the diameter of a distinct image on the retina is less than $\frac{6}{100}$ of an inch; but it is probably much less.

Field-pieces, small cannons, from three to twelve pounders, carried along with an army in the field.

Field-staff, a weapon carried by artillery men, about the length of a halbert, with a spear at the end; having on each side ears screwed on, like the cock of a match-lock, where the gunners fix in lighted matches when they are upon command; and then the field-staffs are said to be armed.

Field-works, in fortification, are those thrown up by an army in besieging a fortress, or by the besieged to defend the place. Such are the fortifications of camps, highways, &c.

FI'ELDED. *a.* (from *field.*) Being in a field of battle (*Shakspeare*).

FIELDING (Henry), a well-known writer of the present age, son of lieutenant-general Fielding, who served under the duke of Marlborough, was born in 1707. He had four sisters; of whom Sarah is well known as the writer of The Adventures of David Simple. On the death of his mother, his father married again; and sir John Fielding, who succeeded him in the commission of the peace for Middlesex, was his brother by this marriage. Henry was sent to study at Leyden; but a failure in his remittances obliged him to return in two years, when his own propensity to gaiety and profusion drove him to write for the stage at 20 years of age. His first dramatic piece, Love in several Masques, which was well received, appeared in 1727: and all his plays and farces, to the amount of 18, were written before the year 1737; and many of them are still acted with applause. While he was thus employed, he married a young lady with 1500*l.* fortune, and inherited an estate of 200*l.* a year from his mother: all which, though on the plan of retiring into the country, he contrived to dissipate in three years; and then applied himself to the study of the law for a maintenance. In losing his fortune, he acquired the gout; which rendering it impossible for him to attend the bar, he with a shattered constitution had recourse to many extempore applications of his pen for immediate supplies; until, soon after the late rebellion, he accepted the office of acting justice for Middlesex, an employment much more profitable than honourable in the public esteem. Reduced at length by the fatigues of this office, and by a complication of disorders, he by the advice of his physicians went to Lisbon, where he died in 1754. He wrote a great number of fugitive pamphlets and periodical essays; but is chiefly distinguished by his Adventures of Joseph Andrews, and History of Tom Jones, of which, the immoral tendency of the latter cannot pass without reprobation. His works have been collected and published, with his life prefixed, by Mr. Murphy.

FIEND. *s.* (ꝼıenꝺ, Saxon.) 1. An enemy; the great enemy of mankind; the devil (*Shakspeare*). 2. An infernal being (*Ben Jonson*).

FIENUS (Thomas), a learned physician, born at Antwerp in 1566. After travelling through Italy he came to Louvain, where he was chosen professor of physic. He died there in 1631. His works are: 1. De viribus Imaginationis. 2. De Formatione et Animatione fœtus. 3. Apologia pro eodem. 4. De Cauteriis. 5. Libri Chirurgici.

FIERCE. *a.* (*fier*, French.) 1. Savage; ravenous; easily enraged (*Job*). 2. Vehement in rage; eager of mischief (*Pope*). 3. Violent; outrageous (*Genesis*). 4. Passionate; angry; furious (*Shakspeare*). 5. Strong; forcible (*James*).

FI'ERCELY. *ad.* Violently; furiously (*Kn.*).

FI'ERCENESS. *s.* (from *fierce.*) 1. Ferocity; savageness (*Swift*). 2. Eagerness for blood; fury (*Sidney*). 3. Quickness to attack; keenness in anger and resentment (*Shaksp.*). 4. Violence; outrageous passion (*Dryden*).

FIERIFA'CIAS. *s.* (In law.) A judicial writ for him that has recovered in an action of debt or damages, to the sheriff, to command him to levy the debt or damages (*Cowell*).

FI'ERINESS. *s.* (from *fiery.*) 1. Hot qualities; heat; acrimony (*Boyle*). 2. Heat of temper; intellectual ardour (*Addison*).

FI'ERY. *a.* (from *fire.*) 1. Consisting of fire (*Spenser*). 2. Hot like fire (*Shakspeare*). 3. Vehement; ardent; active (*Shakspeare*). 4. Passionate; outrageous; easily provoked (*Sh.*). 5. Unrestrained; fierce (*Dryden*). 6. Heated by fire (*Pope*).

FIERENZUOLO, a town of Parma, in Italy, 10 miles S. E. of Placentia. Lat. 44. 59 N. Lon. 9. 44 E.

FIEZOLI, an ancient episcopal town of the Florentino, in Italy, 5 miles N.E. of Florence. Lat. 43. 49 N. Lon. 11. 11 E.

FIFE, or **Fiffario**, a shrill wind instrument of the martial kind, consisting of a short, narrow tube, with holes disposed along the side for the regulation of its tones. It is not blown at the end, but at the side, like a German flute. (*Busby*).

Fife-rails, in a ship, are those that are placed on banisters, on each side of the top of the poop, and so along with hauncers or falls. They reach down to the quarter-deck and to the stair of the gang-way.

FIFESHIRE, a county of Scotland, bounded on the N. by the frith of Tay; on the E by the British ocean; on the S. by the frith of Forth; and on the W. by the counties of Kinrose, Perth, and Clackmannan. It is about 50 miles long; its greatest breadth 16. "This county," says Mr. Pennant, "is so populous, that excepting the environs of London, scarce one in S. Britain can vie with it; fertile in soil, abundant in cattle; happy in collieries, in iron, in lime, and freestone; blessed in manufactures; the property remarkably well divided; none insultingly powerful to distress, and often depopulate a country; most of the fortunes of a useful mediocrity. The number of towns is almost unparalleled in an equal tract of coast; for the whole shore, from Crail to Culross, about 40 miles, is one continued chain of towns and villages." This county contains 93,743 inhabitants.

FI'FTEEN. *a.* (ꝼýꝼtýne, Saxon.) Five and ten.

FI'FTEENTH. *a.* (ꝼýꝼteoða, Saxon.) The ordinal of fifteen; the fifth after the tenth.

Fifteenth, *Decima quinta*, or *Quinzieme*, an ancient tribute, or imposition of money, laid upon any city, borough, or other town, through the realm; not by the poll, or upon this or that man, but in general upon the whole city, or town.

Fifteenth, a musical interval equal to two octaves.

Fifteenth stop. See **Stop fifteenth.**

FIFTH, in music, one of the harmonical intervals or concords; being the second in order, and expressed by the ratio 3 : 2. In the natural scale it comes in the fifth place from the fundamental, being distant from it seven semitones. The ancients called it diapente. The imperfect fifth, or semi-diapente, is less than the fifth by a minor semitone.

Fifth. *a.* (ꝼýꝼta, Saxon.) 1. The ordinal of five; the next to the fourth. 2. All the ordinals are taken elliptically for the part which they express: a *fifth*, a *fifth* part; a *third*, a *third* part (*Swift*).

FI'FTHLY. *ad.* (from *fifth.*) In the fifth place.

FI'FTIETH. *a.* (ꝼıꝼteoᵹoꞃa, Saxon.) The ordinal of fifty.

FI'FTY. *a.* (ꝼıꝼtıᵹ, Saxon.) Five tens.

FIG, or **Fig-tree**. See Ficus.

Fig (Indian), or **Cochineal**. See Cactus.

Fig (Marigold). See Mesembryanthemum.

Fig-eater, in ornithology. See Motacilla.

Fig-wort, in botany. See Scrophularia.

To **Fig**. *v. a.* (See Fico.) 1. To insult with ficoes or contemptuous motions of the fingers (*Shakspeare*). 2. To put something useless into one's head (*L'Estrange*).

FIGGING, in horse-dealing, denotes the introducing a piece of ginger (previously bitten) within the sphincter of the anus, where, by its painful stimulus, it so irritates the animal, that he seems, by the cocking of his tail, the erection of his ears, and the deceptive spirit he displays in action, to be a horse of superior value.

To **FIGHT**. *v. n.* preter. *fought*; part. pass. *fought*. (ꝼeohtan, Saxon.) 1. To contend in battle; to war; to make war; to battle; to contend in arms (*Swift*). 2. To combat; to duel; to contend in single fight (*Esdras*). 3. To act as a soldier in any case (*Dryden*). 4. To contend (*Sandys*).

To **Fight**. *v. a.* To war against; to combat against (*Dryden*).

Fight. *s.* (from the verb.) 1. Battle (*Milton*). 2. Combat; duel (*Dryden*). 3. Something to screen the combatants in ships (*Dry.*).

FI'GHTER. *s.* (from *fight.*) Warriour; duelist (*Shakspeare*).

FI'GHTING. *participial. a.* (from *fight.*) 1. Qualified for war; fit for battle (*Chronicles*). 2. Occupied by war (*Pope*).

Fighting (Cock). See Cockfighting.

FI'GMENT. *s.* (*figamentum*, Lat.) An invention; a fiction; the idea feigned (*Brown*).

FI'GPECKER. *s.* (*fig* and *peck.*) A bird.

FIGUERO-DOS-VINHOS, a town of Portugal, in Estremadura, famous for excellent wine. It is seated among mountains near the river Zizere. Lat. 39. 49 N. Lon. 7. 45 W.

FIGUERAS, or **St. Fernando-de-Figueras**, a strong and important fortress of Spain, in Catalonia. Lat. 42. 18 N. Lon. 2. 46 E.

FI'GULATE. *a.* (from *figulus*, Lat.) Made of potters' clay.

FI'GURABLE. *a.* (from *figuro*, Latin.) Capable of being brought to certain form, and retained in it. Thus lead is *figurable*, but not water (*Bacon*).

FIGURABI'LITY. *s.* (from *figurable.*) The quality of being capable of a certain and stable form.

FI'GURAL. *a.* (from *figure.*) Represented by delineation (*Brown*).

FI'GURATE. *a.* (*figuratus*, Latin.) 1. Of a certain and determinate form (*Bacon*). 2. Resembling any thing of a determinate form: as, *figurate* stones retaining the forms of shells in which they were formed by the deluge.

Figurate, or figural numbers, certain ranks of numbers found by adding together first a rank of units, which is the first order, which gives the 2d order; then these added give the 3d order; and so on. Hence the several orders of figurate numbers, are as follow:

First order -	1 .	1 .	1 .	1 .	1 .	&c.
2d order -	1 .	2 .	3 .	4 .	5 .	&c.
3d order -	1 .	3 .	6 .	10 .	15.	&c.
4th order -	1 .	4 .	10 .	20 .	35.	&c.
5th order -	1 .	5 .	15 .	35 .	70.	&c.

The first order consists all of equals, and the 2d order of the natural arithmetical progression; the 3d order is also called triangular numbers, the 4th pyramidals, the 5th second pyramidals, &c. If the common difference of the first progression were 2, the successive sums would be the series of square numbers, 1, 4, 9, 16, &c. If it were 3, the series would be pentagonal numbers, 1, 5, 12, 22, &c. If it were 4, the series would be hexagonal numbers, 1, 6, 15, 28, &c. And the reason of the names, triangles, squares, pentagons, &c. is that such numbers may be placed in the form of those regular figures. See Maclaurin's Fluxions, Malcolm's Arithmetic, and Simpson's Algebra.

FIGURA'TION. *s.* (*figuration*, Latin.) 1. Determination to a certain form (*Bacon*). 2. The act of giving a certain form (*Bacon*).

FI'GURATIVE. *a.* (*figuratif*, French.) 1. Representing something else; typical; representative (*Hooker*). 2. Not literal (*Stillingfleet*). 3. Full of figures; full of rhetorical exornations (*Dryden*).

Figurative (Counterpoise and Descant). See Counterpoise and Descant.

FI'GURATIVELY. *ad.* By a figure; in a sense different from that which words originally imply; not literally (*Hammond*).

FI'GURE. *s.* (*figura*, Latin.) 1. The form of any thing as terminated by the outline (*Boyle*). 2. Shape; form; resemblance (*Sh.*). 3. Person; external form; appearance mean or grand (*Clarissa*). 4. Distinguished appearance; eminence; remarkable character (*Addison*). 5. Magnificence; splendour (*Law*). 6. A statue; an image; something formed in resemblance of somewhat else (*Addison*). 7. Representation in painting (*Dryden*). 8. Arrangement; disposition; modification (*Watts*).

For other meanings, see the succeeding articles.

Figures, in arithmetic, are the numeral characters; or the characters whereby numbers are expressed, or written. Thus the number four hundred and fifty is written, or expressed, by three figures, 450.

These figures in arithmetic are the nine digits; 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0.

These figures were first brought into Europe by the Moors of Spain; and into England, as Dr. Wallis apprehends, about 1130. See Arithmetic and Character.

Figure, among divines. See Type.

Figure, in astrology. See Horoscope.

Figure, in conic sections, according to Apollonius, is the rectangle contained under the latus-rectum and the transverse axis, in the ellipse and hyperbola.

FIGURE, in geometry, denotes a surface inclosed or circumscribed with one or more lines.

Such are triangles, squares, polygons, circles, ellipses, &c.

Wolfius defines figure a continuum terminated by a perimeter. In which sense, figure is applicable both to superficies and solids. In the former case the perimeter is of lines; in the second of surfaces.

FIGURE, in grammar, is an expression that deviates from the common and natural rules of grammar; either for the sake of elegance or brevity.

The best grammarians only reckon four figures; the ellipsis, pleonasm, syllepsis, and hyperbaton. Others add two more; viz. antiptosis, and enallage.

FIGURE, in heraldry, a bearing in a shield.

FIGURE, in logic, denotes a certain disposition of the terms of a syllogism; particularly of the medium, with regard to the extremes.

Hence it follows, that there are as many figures of syllogisms, as there are different connexions of the extremes with the medium; so that, though the schoolmen ordinarily only reckon three, yet a fourth might be admitted.

In the first figure the medium or middle term is the subject of the major proposition, and the predicate of the minor. This contains four moods, and applies to the proof of all sorts of questions, whether universal or particular, affirmative or negative. In the second figure the middle term is the predicate of both the premises, and this contains four moods, admitting only of negative conclusions.

The third figure requires that the middle term be the subject of both the premises, and has six moods admitting only of particular conclusions. The special rules of these three figures are the following; in the first, the major proposition must always be universal, and the minor affirmative; in the second also the major must be universal, and one of the premises, together with the conclusion, must be negative; in the third figure the minor must be affirmative, and the conclusion always particular.

In the fourth figure, called by the Peripatetics the indirect, and by others, the galenical figure, as varying too much from the natural form, the middle term is predicated in the major proposition, and subjected in the minor. Some logicians will allow this to be nothing else but a mere inversion of the first figure. It has five moods. Watts's Logic, part iii. chap. 2. § 3.

FIGURE, in ancient music, is used for the different dispositions of the notes in a consonance.

FIGURE (Apparent), in optics, that figure, or shape, under which an object appears, when viewed at a distance. This is often very different from the true figure; for a straight line viewed at a distance may appear but as a point; a surface as a line; a solid as a surface; and a crooked figure as a straight one. Also, each of these may appear of different magnitudes, and some of them of different shapes, according to their situation with regard to the eye. Thus an arch of a circle may appear a straight line; a square or parallelogram, a trapezium, or even a triangle; a circle, an ellipsis; angular magnitudes, round; a sphere, a circle, &c.

FIGURE, in rhetoric, any mode of speaking in which words are detorted from their literal and primitive sense. In strict acceptation, the change of a word is a trope, and any affection of a sentence a figure; but they are confounded even by the exactest writers.

A **FIGURE**, which, among related objects, extends the properties of one to another. This figure is not dignified with a proper name, because it has been overlooked by writers. Giddy brink, jovial wine, daring wound, are examples of this figure. Here are adjectives that cannot be made to signify any quality of the substantives to which they are joined: a brink, for example, cannot be termed giddy in a sense, either proper or figurative, that can signify any of its qualities or attributes. When we examine attentively the expression, we discover, that a brink is termed giddy, from producing that effect in those who stand on it: in the same manner, a wound is said to be daring, not with respect to itself, but with respect to the boldness of the person who inflicts it: and wine is said to be jovial, as inspiring mirth and jollity. Thus the attributes of one subject are extended to another with which it is connected; and the expression of such a thought must be considered as a figure, because the attribute is not applicable to the subject in any proper sense. In the expression bold dead, or *audax facinus*, we extend to the effect what properly belongs to the cause. But to give a complete idea of the subject, we insert the following view of the different relations that may give occasion to this figure. And here it will be observed, that the figure can never have any grace but where the relations are of the most intimate kind.

1. An attribute of the cause expressed as an attribute of the effect.

An impious mortal gave the *daring* wound.
———————To my *advent'rous* song,
That with no middle flight intends to soar.
PARADISE LOST.

2. An attribute of the effect expressed as an attribute of the cause.

Quos periisse ambos *misero* censebam in mari.
PLAUTUS.
No wonder, fallen such a *pernicious* height.
PARADISE LOST.

3. An effect expressed as an attribute of the cause.

Casting a dim *religious* light. MILTON, *Comus*.
And the *merry* bells ring round,
And the *jocund* rebecks sound. MILTON, *Allegro*.

4. An attribute of a subject bestowed upon one of its parts or members.

Longing arms.
It was the nightingale, and not the lark,
That pierc'd the *fearful* hollow of thine ear.
ROMEO AND JULIET, act. 3. sc. 7.

5. A quality of the agent given to the instrument with which it operates.

Why peep your *coward* swords half out their shells?

6. An attribute of the agent given to the subject upon which it operates.

High-climbing hill. MILTON.

7. A quality of one subject given to another.

Then, nothing loth, th' enamour'd fair he led,
And sunk transported on the *conscious* bed.
ODYSSEY, viii. 337.
A *stupid* moment motionless she stood.
THOMSON'S SUMMER, l. 1336.

8. A circumstance connected with a subject, expressed as a quality of the subject.

'Tis ours the chance of *fighting* fields to try.
ILIAD, i. 301.

Oh! had I dy'd before that *well-fought* wall.
ODYSSEY, v. 395.

From this account it appears, that the adorning a cause with an attribute of the effect is not so agreeable as the opposite expression. The progress from cause to effect is natural and easy: the opposite progress resembles retrograde motion; and therefore *panting height*, *astonish'd thought*, are strained and uncouth expressions, which a writer of taste will avoid.

Another rule regards this figure, that the property of one subject ought not to be bestowed upon another with which that property is incongruous.

K. Rich.———How dare thy joints forget
To pay their *awful* duty to our presence?
RICHARD II. act. 3. sc. 6.

The connection between an awful superior and his submissive dependent is so intimate, that an attribute may readily be transferred from the one to the other: but awfulness cannot be so transferred, because it is inconsistent with submission.

FIGURE of speech, as peculiarly distinguished from the above, and from those first referred to, is defined, "The using a word in a sense different from what is proper to it;" and the new or uncommon sense of the word is termed the figurative sense. The figurative sense must have a relation to that which is proper; and the more intimate the relation is, the figure is the more happy. How ornamental this figure is to language will not be readily imagined by any one who hath not given it peculiar attention; and therefore we shall endeavour to unfold its capital beauties and advantages. In the first place, a word used figuratively, or in a new sense, suggests at the same time the sense it commonly bears; and thus it has the effect to present two objects; one signified by the figurative sense, which may be termed *the principal object;* and one signified by the proper sense, which may be termed *accessory:* the principal makes a part of the thought; the accessory is merely ornamental. In this respect, a figure of speech is precisely similar to concordant sounds in music, which, without contributing to the melody, make it harmonious.

To explain the matter by examples. Youth, by a figure of speech, is termed *the morning of life.* This expression signifies youth, the principal object which enters into the thought; it suggests at the same time, the proper sense of morning; and this accessory object, being in itself beautiful, and connected by resemblance to the principal object, is not a little ornamental. *Imperious ocean* is an example of a different kind, where an attribute is expressed figuratively: together with *stormy*, the figurative meaning of the epithet *imperious*, there is suggested its proper meaning, viz. the stern authority of a despotic prince; and these two are strongly connected by resemblance.

In the next place, this figure possesses a signal power of aggrandizing an object, by the following means. Words, which have no original beauty but what arises from their sound, acquire an adventitious beauty from their meaning: a word signifying any thing that is agreeable, becomes by that means agreeable; for the agreeableness of the object is communicated to its name. This acquired beauty, by the force of custom, adheres to the word even when used figuratively; and the beauty received from the thing it properly signifies, is communicated to the thing which it is made to signify figuratively. Consider the foregoing expression *imperious ocean*, how much more elevated it is than *stormy ocean*.

Thirdly, this figure hath a happy effect by preventing the familiarity of proper names. The familiarity of a proper name is communicated to the thing it signifies by means of their intimate connection; and the thing is thereby brought down in our feeling. This bad effect is prevented by using a figurative word instead of one that is proper; as, for example, when we express the sky, by terming it *the blue vault of heaven*; for, though no work of art can compare with the sky in grandeur, the expression, however, is relished, because it prevents the object from being brought down by the familiarity of its proper name.

Lastly, by this figure, language is enriched, and rendered more copious; in which respect, were there no other, a figure of speech is a happy invention.

The beauties we have mentioned belong to every figure of speech. Several other beauties peculiar to one or other sort we shall have occasion to remark elsewhere. See METAPHOR.

Not only subjects, but qualities, actions, effects, may be expressed figuratively. Thus, as to subjects, *gates of breath* for the lips, *the watery kingdom* for the ocean. As to qualities, *fierce* for stormy, in the expression *fierce winter*; *altus* for profundus, *altus puteus*, *altum mare*; *breathing* for perspiring, *breathing plants*. Again, as to actions, The sea *rages*, Time will *melt* her frozen thoughts, Time *kills* grief. An effect is put for the cause, as *lux* for the sun; and a cause for the effect, as *bonum labores* for corn. The relation of resemblance is one plentiful source of figures of speech; and nothing is more common than to apply to one object the name of another that resembles it in any respect. Height, size, and worldly greatness, resemble not each other; but the emotions they produce resemble each other, and, prompted by this resemblance, we naturally express worldly greatness by height or size: one feels a certain uneasiness in seeing a great depth; and hence depth is made to express any thing disagreeable by excess, as depth of grief, depth of despair: again, height of place, and time long past, produce similar feelings; and hence the expression, *Ut altius repetam!* Distance in past time, producing a strong feeling, is put for any strong feeling; *Nihil mihi antiquius nostra amicitia:* Shortness with relation to space, for shortness with relation to time; *Brevis esse laboro, obscurus fio:* Suffering a punishment resembles paying a debt; hence *pendere pœnas.* In the same manner, light may be put for glory, sunshine for prosperity, and weight for importance.

Many words, originally figurative, having by long and constant use lost their figurative power, are degraded to the inferior rank of proper terms. Thus the words that express the operation of the mind have in all languages been originally figurative: the reason holds in all, that when these operations came first under consideration, there was no other way of describing them but by what they resembled: it was not practicable to give them proper names, as may be done to objects that can be ascertained by the sight and touch.

A soft nature, jarring tempers, weight of woe, pompous phrase, beget compassion, assuage grief, break a vow, bend the eye downward, shower down curses, drown'd in tears, wrapt in joy, warm'd with eloquence, loaded with spoils, and a thousand other expressions of the like nature, have lost their figurative sense. Some terms there are that cannot be said to be altogether figurative, or altogether proper: originally figurative, they are tending to simplicity, without having lost altogether their figurative power. Virgil's *regina saucia cura* is perhaps one of these expressions: with ordinary readers, *saucia* will be considered as expressing simply the effect of grief; but one of a lively imagination will exalt the phrase into a figure.

For epitomising this subject, and at the same time for giving a clear view of it, lord Kames gives a list of the several relations upon which figures of speech are commonly founded. This list he divides into two tables; one of subjects expressed figuratively, and one of attributes. See *Elements of Criticism*, vol. ii. p. 305.

Lastly, though figures of speech have a charming effect when accurately constructed and properly introduced, they ought, however, to be scattered with a sparing hand; nothing is more luscious, and nothing consequently more satiating, than redundant ornaments of any kind.

Figure of the Sines, Cosines, Versed-sines, Tangents, or Secants, &c. are figures made by conceiving the circumference of a circle extended out in a right line, upon every point of which are erected perpendicular ordinates equal to the sines, cosines, &c. of the corresponding arcs; and then drawing the curve line through the extremity of all these ordinates; which is then the figure of the sines, cosines, &c. See figs. 1, 2, 3, 4, 5, 6, 7, 8. pl. 68.

Construction of the Figures of Sines, Cosines, &c.

Let ADB, &c. (fig. 1.) be the circle, AD an arc, DE its sine, CE its cosine, AE the versed sine, AF the tangent, GH the cotangent, CF the secant, and CH the cosecant. Draw a right line *aa* equal to the whole circumference ADGBA of the circle, upon which lay off also the lengths of several arcs, as the arcs at every 10°, from 0 at *a*, to 360° at the other end at *a*; upon these points raise perpendicular ordinates, upwards or downwards, according as the sine, cosine, &c. is affirmative or negative in that part of the circle; lastly, upon these ordinates set off the length of the sines, cosines, &c. corresponding to the arcs at those points of the line or circumference *aa*, drawing a curve line through the extremities of all these ordinates; which will be the figure of the sines, cosines, versedsines, tangents, cotangents, secants, and cosecants, as in the figures. Where it may be observed, that the following curves are the same, viz. those of the sines and cosines, those of the tangents and cotangents, and those of the secants and cosecants; only some of their parts a little differently placed.

It may be known when any of these lines, viz. the sines, cosines, &c. are affirmative or negative, i. e. to be set upwards or downwards, by observing the following general rules for those lines in the 1st, 2d, 3d, and 4th quadrants of the circle.

The sines	*in the 1st and 2d are*	*affirmative,*
	in the 3d and 4th	*negative:*
The cosines	in the 1st and 4th are	affirmative,
	in the 2d and 3d	negative:
The tangents	in the 1st and 3d are	affirmative,
	in the 2d and 4th	negative:
The cotangents	in the 1st and 3d are	affirmative,
	in the 2d and 4th	negative:
The secants	in the 1st and 4th are	affirmative,
	in the 2d and 3d	negative:
The cosecants	in the 1st and 2d are	affirmative,
	in the 3d and 4th	negative:

And all the versedsines are affirmative.

To find the Equation and Area, &c. to each of these Curves.

Draw any ordinate *de*; putting $r =$ the radius AC of the given circle, $x = ad$ or AD any absciss or arc, and $y = de$ its ordinate, which will be either the sine DE $= s$, cosine CE $= c$, versedsine AE $= v$, tangent AF $= t$, cotangent GH $= \tau$, secant, CF $= f$, or cosecant, CH $= \sigma$, according to the nature of the particular construction. Now, from the nature of the circle, are obtained these following general equations, expressing the relations between the fluxions of a circular arc and its sine, or cosine, &c.

$$\dot{x} = \frac{r\dot{s}}{\sqrt{r^2-s^2}} = \frac{-r\dot{c}}{\sqrt{r^2-c^2}} = \frac{r\dot{v}}{\sqrt{2rv-vv}} = \frac{r^2\dot{t}}{r^2+t^2}$$

$$= \frac{-r^2\dot{\tau}}{r^2+\tau^2} = \frac{r^2\dot{f}}{f\sqrt{f^2-r^2}} = \frac{-r^2\dot{\sigma}}{\sigma\sqrt{\sigma^2-r^2}}$$

And these also express the relation between the absciss and ordinate of the curves in question, each in the order in which it stands; where x is the common absciss to all of them, and the respective ordinates are s, c, v, t, τ, f and σ. And hence the area, &c. of each of these curves has been found as follows:

1. In the figure of the sines, when the fluxion of the area is found, its correct fluent gives $r^2 \mp r\sqrt{r^2-s^2} = r^2 - rc = rv$, the rectangle of radius and versed sine, i. e. − or +, as s is increasing or decreasing; which is a general expression for the area. When $s = o$, as at a or b, this expression becomes o, or $2r^2$; so that when ad becomes a quadrant, af, r^2 is the area of afg.

The length of the line or figure of sines is equal to half the perimeter of an ellipse, whose axes are to one another, as $\sqrt{2}$ to 1, and whose conjugate axis is equal to the diameter of the circle, from which the line of sines is conceived to be generated; as is ingeniously demonstrated by Mr. Wallace, R. M. C. at p. 187. No. 8, Leybourn's Repository.

2. In the figure of cosines, we have rs, the rectangle of the radius and sine for the general area $adec$; and when af is equal to a quadrant, the area becomes $= r^2$.

3. In the figure of the versed sines, we have $r \times \text{AD} - \text{DE}$ for the area. When AD or ad is a quadrant, this becomes $\frac{3\cdot1416}{2} r^2 - r^2 =$ the area afg. And when AD or ad is a semicircle, it becomes $3\cdot1416\, r^2 =$ the area abg in this figure.

4. In the figure of tangents, we have $r^2 \times$ hyp. log. of $\frac{f}{r}$, for the area ade. When ad becomes a quadrant, the area afg becomes infinite. The same for the figure of cotangents, beginning at f instead of a.

5. For the figure of the secants, we have $r^2 \times$ hyp. log of $\frac{s+\sqrt{s^2-r^2}}{r}$, for the area *ade*, which expression is infinite when *ad* becomes the quadrant. The same might be remarked respecting the figure of cosecants, beginning at *f* instead of *a*.

From hence the meridional parts in Mercator's chart may be calculated for any latitude AD or *ad*: For the merid. parts are to the arc of latitude AD : : as the sum of the secants to the sum of as many radii or : : as the area *ade*: to *ad* × radius *ac* or AD × AC in the 1st figure. See Emerson's Miscellanies, p. 232, &c.

To FI'GURE. *v. a.* (*figuro*, Latin.) 1. To form into any determinate shape (*Dryden*). 2. To show by a corporeal resemblance (*Spen.*). 3. To cover or adorn with figures (*Shakspeare*). 4. To diversify; to variegate with adventitious forms or matter (*Shakspeare*). 5. To represent by a typical or figurative resemblance (*Hooker. Donne*). 6. To image in the mind (*Temple*). 7. To prefigure; to foreshow (*Shakspeare*). 8. To form figuratively; to use in a sense not literal (*Locke*). 9. To note by characters (*Dryden*).

FI'GURE-FLINGER. *s.* (*figure* and *fling*.) A pretender to astrology (*Collier*).

FILA'CEOUS. *a.* (from *filum*, Latin.) Consisting of threads (*Bacon*).

FI'LACER. *s.* (*filazarius*, low Lat. *filum*.) An officer in the Common Pleas, so called because he files those writs whereon he makes process (*Harris*).

FI'LAGO. Cotton-weed. In botany, a genus of the class syngenesia, order polygamia necessaria. Receptacle chaffy; downless; calyx imbricate; florets of the margin seated among the scales of the calyx. One species only; a white woolly plant of the south of Europe, with sessile and nearly stemless flowers.

FILAMENT, in botany, filamentum, (*filum*, a thread). The thread-like part of the stamen, supporting the anther, and connecting it with the flower. Pars elevans adnectensque antheram.

Filaments, in the same flower, are: 1. Equal, or all of the same length. 2. Unequal, or of different lengths. 3. Connate, or united. 4. Alternate. Most filaments are simple; some few are bifid; and others tricuspidate, or broad and trifid at the end.

FILANDERS, in falcony, a disease in hawks, &c. consisting of filaments of coagulated blood; occasioned by the rupture of some vein, by which the blood is extravasated, and hardens into cords which inflame and become painful.

FILANDERS, in the same science, are also worms as small as thread, and about an inch long, that lie wrapt up in a thin skin or net, near the reins of a hawk, apart from either gut or gorge. This malady is known by the hawk's poverty; by ruffling her tail; by her straining the fist or perch, with her pounces; and, lastly, by croaking in the night, when the filanders prick her. The disease usually proceeds from bad food; and may be remedied by giving the hawk a clove of garlic.

FILARIA, in zoology, a genus of the class vermes, order intestina. Body round, filiform, equal and quite smooth; mouth dilated, with a roundish lip. Eighteen species:

A. Infesting mammals.
B. ———— birds.
C. ———— insects when perfect.
D. ———— insect larves.

The division A. found in different varieties in man, the cellular membrane of the horse, in the lion, the martin, and hare.

B. In hawks, owls, crows, storks, and poultry. C. In the scarabæus fimetarius; silpha obscura, carabas, and gryllus. D. In the papilio articæ; p. betulæ; p. quercus; sphinx Euphorbiæ; phalæna caja; ph. quercus; ph. pellionella; found under the skin of the larves, and very destructive to them; sometimes solitary, and from four to seven inches long. The species chiefly worthy of notice is

F. medinensis, of the division A, is the dracunculus or Guinea-worm. Body entirely pale yellowish. It inhabits both the Indies, and is frequent in the morning dew, whence it enters the naked feet of the slaves, and creates the most troublesome itchings, generally accompanied with inflammation and fever. It must be cautiously drawn out by means of a piece of silk tied round its head: for if, by being too much strained, the animal should break, the part remaining under the skin grows with redoubled vigour, and often occasions a fatal inflammation. It is frequently twelve feet long, and not larger than a horse-hair.

FILBERT, or FILBERT-TREE. See CORYLUS.

To FILCH. *v. n.* To steal; to take by theft; to pilfer. Usually spoken of petty thefts (*Gay*).

FI'LCHER. *s.* (from *filch*.) A thief; a petty robber.

FILE. *s.* (*file*, Fr. *filum*, a thread, Latin.) 1. A thread: not used (*Wotton*). 2. A line on which papers are strung to keep them in order (*Bacon*). 3. A catalogue; roll; series (*Shakspeare*). 4. A line of soldiers ranged one behind another. 5. (ꝼeol, Saxon.) An instrument to rub down prominences (*Moxon*).

FILES (Manufactory of). Many useful tools have been invented for performing mechanical operations, which consist of a number of wedges or teeth, which may be conceived to stand upon, or rise out of a flat or curved metallic surface. When these teeth are formed upon the edge of a plate, the instrument is called a saw; but when they are formed upon a broad surface, it constitutes what is known by the name of a file. The comb-makers and others use a tool of this description, called a quonet, having coarse single teeth, to the number of about seven or eight in an inch. Fine tools of the same kind, namely, with single teeth, are called floats. When the teeth are crossed they are called files; and when instead of the notches standing in a right line, a number of single individual teeth are raised all over the surface, it is called a rasp. As the art of making files is nearly the same in its practice with regard to all the great variety of forms in which they are made, we shall confine our description to that of the flat file.

Very little need be said in explanation of the method of forging these articles. They are usually made of steel, or more rarely of iron, case-hardened. The forged files are brought to a flat surface on the grindstone, and are then ready for the file-cutter. This artist is provided with a great number of chisels, consisting each of a piece of steel of moderate thickness, having a straight edge, of greater length than the height of the chisel, the back of which terminates in a blunt angle or point in the middle of its length, upon which the blows are struck with a hammer of about five or six pounds weight, for middling sized files, having its head all on one side of the stem, so as to resemble the capital letter L, in order that it may by its own weight naturally dispose itself with the face downwards. The file is placed upon a plate of lead on a small low anvil, close to which the workman sits, and on the left side of the block of the anvil are fastened the two ends of a leather strap, which he brings over the file, and by putting his right foot into the loop, holds it steadily in its place. In this situation, taking the chisel between his left finger and thumb, he applies its edge across the file, where the cuts are to begin at the point, and gives it a blow; the direction of the cut being inclined towards the tang, or that end of the file which is to go into the handle. Immediately after this commencing operation, he lifts the chisel, places its edge behind the other cut, and slides it forward till he feels it bear against the bur or protuberancy of the former cut, at which instant he gives the second blow; a third is repeated in like manner, and by a continuance of the same proceeding, the whole surface at length becomes covered with single strokes or notches, each of which presents an elevated sharp edge. The distance between stroke and stroke, or which is the same thing, the coarseness of the file, depends entirely upon the violence of the blow, by which the bur is raised to a greater or a less height; but it is not difficult with so weighty a hammer, after a very little practice, to give the strokes with great uniformity of impulse, and to repeat them with such frequency as to perform this apparently delicate work with great speed and precision. The coarsest files have about ten or twelve cuts in the inch of length, and the very finest have upwards of two hundred.

As soon as the whole surface of the file has been thus cut, the workman files the bur off with a small file, so as to leave very little more of the stroke than what has entered below the original surface; and then proceeds to give the second or cross cut, forming an angle of about sixty degrees, with the first range of strokes. The intention to be answered by filing off the first edges to afford a more even surface for cutting the second, which is done exactly in the same manner as the first range, and likewise to give a suitable figure to the small teeth or lozenge-shaped prominences, which stand up upon the face of the file after the cutting is completed. If this filing off were to be omitted, the teeth would be pointed and irregular; whereas the useful and durable figure is that of a small rounded chisel or gouge.

It may be remarked, upon examining a file, that the first cut is always made more slantwise than the second. If this were not done, the small teeth would all lie behind one another, in rows in the direction of the length of the file, which would make corresponding grooves in the face of any piece of work, that might be to be filed, instead of leaving the workman at liberty to vary his strokes, as is necessary when a flat surface is to be produced.

When the file is cut and finished on both sides, and on one or both edges, as may be required, it is ready for hardening, which is a chemical operation of some skill and ingenuity. The heat is given in a furnace, where the work can be regularly disposed, and for fine work a muffle is used. The file is first exposed to a low degree of ignition, which burns off any greasy or other matter, that might adhere to its surface. It is then dipped, cold, in the grounds or thick sediment of beer, and while wet into a powder made of burned or parched horn, or leather, or other coally animal matter, and of common salt, and in this state speedily dried by exposure to heat. Any other mucilage which could be afforded at a moderate price would probably answer the same purpose as the beer grounds. The file being then put into the ignited muffle, smokes and soon becomes red-hot, being not only defended from oxydation, by the covering of fused salt, and animal coal, which envelopes it on all sides, but being even rendered more steely upon its surface by the absorption of carbon. As soon as it has acquired the low red heat called cherry-red, it is taken out and plunged into pure cold water, which instantly cools it, and renders it very hard.

There are several variations adopted in the hardening process by different workmen, by means of which they differ in their success. Some file-makers, as well as gunsmiths and locksmiths, produce the intended effect so completely, that the whole surface of their work has a beautiful dull-grey aspect, every where alike; whereas, other operations produce coally spots, which are obliged to be cleaned off. The files, when quite dry and clean, are slightly oiled and kept in oiled paper.

The simple operation of file-cutting seems to be of such easy performance, that it is not at all to be wondered at that machines for this purpose should have been very early invented. Mathurin Jousse, in La Fidelle Ouverture de l'Art de Serrurier, published at La Fleche, in Anjou, in 1627, gives a drawing and description of one, in which the file is drawn along by shifts by wheel-work, and the blow is given by a hammer, which is tripped by the machinery. There are several in the Machines Approuvées par l'Academie Royale de Paris;

and one in the American Philosophical Transactions, described also in the 2d volume of Gregory's Mechanics. Mr. William Nicholson took out a patent in August, 1802, for improved machinery in the manufacture of files, the specification of which is published in the Repertory of Arts, &c. vol. 2. N. S.*

The principal requisites in a machine for file-cutting are, that the file should be steadily supported, and the chisel adapted to the face without any unequal bearing. Files are however, for the most part, cut by hand; and the chief reasons are, 1. The cut by hand is, from its very nature, exactly of the depth the bur demands; whereas, in a machine, if the stroke be not nicely adapted to the shift, the file may be either shallow-cut, or its bur may be thrown too close by an over heavy stroke; and, 2. In machine-cut files, there must always be a piece left at the beginning, at each corner, which requires to be cut off before hardening. This may be remedied in the machinery, but it has not yet been done. (*British Encyclo.*)

To FILE. *v. n.* (from *filum.*) A thread. 1. To string upon a thread or wire (*Arbuthnot*). 2. (from ꝼeolan, Saxon.) To cut with a file (*Ray*). 3. To smooth; to polish (*Shaksp.*). 4. (from ꝼilan, Saxon.) To foul; to sully (*Shakspeare*).

To FILE. *v.n.* To march in a file, not abreast, but one behind another (*Blackmore*).

FILE-FISH, in ichthyology. See BALISTES.

FI'LECUTTER. *s.* (*file* and *cutter.*) A maker of files (*Moxon*).

FILEMOT. *s.* (from *feuille morte*, a dead leaf, French.) A brown or yellow-brown colour (*Swift*).

FI'LER. *s.* (from *file.*) One who files; one who uses the file in cutting metals.

FI'LIAL. *a.* (*filial*, Fr. *filius*, Latin.) 1. Pertaining to a son; befitting a son (*Sidney*). 2. Bearing the character or relation of a son (*Milton*).

FILIA'TION. *s.* (from *filius*, Latin.) The relation of a son to a father; correlative to paternity (*Hale*).

FILIBEG. See PHILIBEG.

FILICES. Ferns. The fourth family; and the sixth great tribe or nation, in Linnéus's general distribution of vegetables. The first order of the class cryptogamia in his artificial system. The sixty-fourth order in his fragments of a natural method: and the fifty-fifth of his natural orders, at the end of gen. plant.

FILIFORM. (*filiformis.*) In botany, thread-shaped. Of equal thickness from top to bottom, like a thread. Applied to peduncle, filament, style, and receptacle. It seems more elegant to use filament and filiform, than to translate them by thread, and thread-shaped.

FI'LINGS. *s.* (from *file.*) Fragments rubbed off by the action of the file.

FILIPENDULA. (*filipendula*, from *filum*, a thread, and *pendeo*, to hang, so named because the numerous bulbs of its root hang as it were by small threads). Saxifraga rubra. Dropwort. The root of this plant, spiræa filipendula; foliis pennatis, foliolis uniformibus serratis, caule herbaceo, floribus corymbosis of Linnéus, possesses adstringent, and it is said lithontriptic virtues. It is seldom used in the practice of the present day. See SPIRÆA.

FILIX. (*filix.*) Male polypody, or fern. Polypodium filix mas of Linnéus. The root of this plant has lately been greatly celebrated for its effects upon the tænia solium or broad tape-worm. Madame Noufer acquired great celebrity by employing it as a specific. This secret was thought of such importance by some of the principal physicians at Paris, who were deputed to make a complete trial of its efficacy, that it was purchased by the French king, and afterwards published by his order. The method of cure is the following: After the patient has been prepared by an emollient clyster, and a supper of panada, with butter and salt, he is directed to take in the morning, while in bed, a dose of two or three drachms of the powdered root of the male fern. The powder must be washed down with a draught of water, and two hours after a strong cathartic, composed of calomel and scammony, is to be given, proportioned to the strength of the patient. If this do not operate in due time, it is to be followed by a dose of purging salts, and if the worm be not expelled in a few hours, this process is to be repeated at proper intervals. Of the success of this, or a similar mode of treatment, in cases of tænia, there can be no doubt, as many proofs of it in this country afford sufficient testimony; but whether the fern-root or the strong cathartic be the principal agent in the destruction of the worm may admit of a question.

FILIX FÆMINA. The female fern. The plant which is thus called in the pharmacopœias is not the polypodium filix fæmina, but the pteris aquilina; frondibus supradecompositis, foliolis pinnatis pinnis lanceolatis, infimis pinnatifidis, superioribus minoribus of Linnéus. The root is esteemed as an anthelmentic, and is supposed to be as efficacious in the destroying the tape-worm as the root of the male-fern.

FILIX MAS. See FILIX.

To FILL. *v. a.* (ꝼyllan, Saxon.) 1. To store till no more can be admitted (*John*). 2. To store abundantly (*Milton*). 3. To satisfy; to content (*Cheyne*). 4. To glut; to surfeit (*Shakspeare*). 5. *To* FILL *out.* To pour out liquor for drink. 6. *To* FILL *out.* To extend by something contained (*Dryden*). 7. *To* FILL *up.* To make full (*Pope*) 8. *To* FILL *up.* To supply (*Addison*). 9. *To* FILL *up.* To occupy by bulk (*Burnet*). 10. *To* FILL *up.* To engage; to employ (*Shakspeare*).

To FILL. *v. n.* 1. To give to drink (*Shakspeare*). 2. To grow full. 3. To glut; to satiate (*Bacon*). 4. *To* FILL *up.* To grow full (*Woodward*).

FILL. *s.* (from the verb.) 1. As much as may produce complete satisfaction (*Fairfax*). 2. The place between the shafts of a carriage; the thill (*Mortimer*).

FILLAGREE, FILIGREE, or FILIGRANE, work, a kind of enrichment on gold or silver, wrought delicately, in manner of little threads or grains, or both intermixed. The word is compounded of *fil* or *filum*, thread, and *granum*, grain. In Latin it is called *filatim elaboratum opus, argentum, aurum.*

There is no manufacture in any part of the world that has been more admired and celebrated than the fine gold and silver fillagree of Sumatra: and what renders it a matter of greater curiosity is the coarseness of the tools employed in the workmanship, and which, in the hands of an European, would not be thought sufficiently perfect for the most ordinary purposes. The whole of this ingenious process is circumstantially related in Marsden's Account of Sumatra, p. 141.

The work usually executed by young ladies in this country under the title of fillagree, and of which tea-caddies, vases, work-baskets, &c. are constructed, is formed of narrow slips of coloured paper gilt at the edges, and curiously rolled up and glued in various fanciful forms, with the gilt edge outwards.

FI'LLER *s* (from *fil.*) 1. Any thing that fills up room without use (*Dryden*). 2. One whose employment is to fill vessels of carriage (*Mortimer*).

FI'LLET. *s.* (*filet*, French) 1. A band tied round the head or other part (*Dryden*). 2. The fleshy part of the thigh: applied commonly to veal. (*Dryden*) 3. Meat rolled together and tied round (*Swift*).

Fillet, or Filet, in architecture, denotes a little square member or ornament used in divers places and on divers occasions, but generally as a sort of corona over a greater moulding.

Fillet, in heraldry, a kind of orle or bordure, containing only a third or fourth part of the breadth of the common bordure. It is supposed to be withdrawn inwards, and is of a different colour from the field. It runs quite round, near the edge, as a lace over a cloak. It is also used for an ordinary, drawn like a bar, from the sinister point of the chief, across the shield, in manner of a scarf.

Fillets, in the manage, the loins of a horse; seated above the flank, beyond the last rib, and in a transverse line with the hip-bone. A horse long in the back, narrow across the loins, and tucked up (greyhound like) in the carcase, is said to be badly made in the fillets, or, in other words, weak in the loins.

To Fi'llet. *v. a.* (from the noun) 1. To bind with a bandage or fillet. 2. To adorn with an astragal (*Exodus*).

To FI'LLIP. *v. a.* To strike with the nail of the finger by a sudden spring (*Bacon*).

Fi'llip. *s.* A jerk of the finger let go from the thumb.

FILLY, the female produce of a horse and mare: she is called a filly foal, the first year; a yearling the second; and a filly till four years old.

FILM. *s.* (ꝼylmeꞃa, Saxon.) A thin pellicle or skin (*Graunt*).

To Film. *v. a.* (from the noun.) To cover with a pellicle or thin skin (*Shakspeare*).

FILMER (Sir Robert), an English writer, born in Kent at the beginning of the 17th century, and educated at Trinity college, Cambridge. His works are; 1. The Anarchy of a limited and mixed Monarchy. 2. Patriarcha; in which he strives to prove, that all government was at first monarchical, even in the patriarchal ages. 3. The Freeholder's Grand Inquest. He died about 1688.

FI'LMY. *a.* (from *film.*) Composed of thin membranes or pellicles (*Pope*).

To FI'LTER. *v. a.* (*filtro*, low Latin.) 1. To defecate by drawing off liquor by depending threads. 2. To strain; to percolate (*Grew*).

Filter, or Filtre, in chemistry, &c. a piece of woollen cloth, linen, paper, or other matter, some of which are in the form of hollow inverted cones, used to filtrate or strain liquors through. The filtre has the same use and effect with regard to liquids that the sieve or searce has on dry substances. Filters are of two sorts. The first are simple pieces of paper or cloth, through which the liquor is passed without farther trouble. The second are twisted up like a skain or wick, and first wetted, then squeezed, and one end put in the vessel that contains the liquor to be filtrated; the other end is to be out, and hang down below the surface of the liquor: by means hereof the purest part of the liquor distils drop by drop out of the vessel, leaving the coarser part behind. This filter acts as a siphon.

Water is freed from various impurities by means of basins made of porous stones, through which the water descends by percolation and becomes purified. But as filtering stones of this kind are not always to be readily procured, other contrivances have been devised; one or two of which we shall here describe.

A patent was granted to Mr. Joshua Collier of Southwark, for a most ingenious method of filtering and sweetening water, oil, and every other liquid. The following is the contrivance which combines the application of machinery with the antiseptic properties of charcoal. Fish oil is one of the liquids which he had particularly in view, to free it from every thing disagreeable, either in taste, smell, or colour, to accomplish which he poured a quantity of oil into a convenient vessel, heated to the temperature of 120° of Fahrenheit's thermometer, adding caustic mineral alkali of the specific gravity of 1·25. He then agitated the mixture, afterwards allowing it to stand till the sediment subsided, and then drew it off into another vessel, with a sufficient quantity of burnt charcoal finely powdered, and a small quantity of diluted sulphuric acid, to decompose the saponaceous matter still suspended in the oil, when the oil became clear at the surface; he then agitated the contents of this vessel, and left the coally, saline, and aqueous particles to subside; afterwards passing it through proper strainers, when it became quite transparent and fit for use.

The principle of the improved filtering machines consists in combining hydrostatic pressure with the mode of filtering *per ascensum*, which procures the peculiar advantage of causing the fluid and its sediment to take opposite directions. The filtering surface remains the same, while the dimensions of the chamber in which the sediment is received may be varied. To adapt the machines to every purpose for which they are intended, chambers must be provided of various capacities, for the precipitated matter. The space required is very great with respect to the oil trade, and as all dimensions will be required occasionally, no particular limits can be fixed. For distilleries and breweries they may be smaller in proportion, and a very small chamber will be sufficient for domestic economy. If water is to be freed from noxious particles, it must be made to pass through an iron box in its way to the filtering chamber, and the box must contain charcoal finely powdered; the water is received into this box, and delivered by two apertures, which are opened and closed by cocks. Another part of the invention consists in filtering machines in the form of stills, in which charcoal may be repeatedly burnt after any fluid substances have passed through it, for the porpose of freeing them from noxious particles, or discharging their colouring matter.

To the filtering apparatus of Mr. Collier, instruments are attached for discovering the comparative qualities of oils, which depend in some measure on their specific gravities; spermaceti oil, when compared with fish oils, being as 875 to 920. To do this a glass vessel of any shape most convenient is employed, with a glass bubble, and a thermometer. If the oil is pure, the bubble sinks, when the mercury rises to a particular standard. When spermaceti oil is impure, the bubble floats, though of the temperature required. To determine the tendency of oils, used for burning, to congeal in cold weather, a freezing mixture may be put into a phial of thin glass, into which let a thermometer be immersed, and a single drop of the oil permitted to fall on the outside of the vessel, where it will instantly congeal. As the cold produced by the mixture decreases, let the temperature be observed, by the thermometer, at which the oil becomes fluid, and runs down the side of the glass.

When we reflect on the method which nature pursues in the filtration of water, we find that such waters as descend from hills, though passing through sand and rocks, are seldom perfectly pure; but that those are the most limpid which, by ascending, ooze out near the foot of a mountain. The cause of this difference appears to be owing to the circumstance, that if the water only descend through sand, the finest and most weighty foreign particles gradually penetrate through the sandy strata; on the contrary, when it is forced to rise through sand, all such ponderous ingredients settle at the bottom; because, from their greater specific gravity, they cannot ascend to the top. The lighter particles of fluids, consequently, in both cases remain in the upper strata of the earth or sand.

From these considerations Professor Parrot, jun. of Paris, was induced to give his filtering machine the form represented in Plate 68. fig. 9.

The principal part of the machinery consists of a square vessel, bent in the form of an inverted syphon. The curve may be circular, elliptic, or in any other direction. This vessel is filled with fine pure sand, till nearly the height of the dotted line *x*, *y*, which denotes the ascent of the water to D, whence it flows into the receiver. The part marked A, B, should always project above this line, according to the size of the filtering machine. To A, B, there is attached a woollen bag, which is open at the top, and the lower part of which touches the sand. It serves the purpose of collecting the coarsest impurities, and thus preserves the sand for a longer time from becoming foul. The bag, therefore, may occesionally be removed, and rinsed in clean water. It is evident that the water flows at A, through the bag into the filtre, and rises at the place marked D, which is considerably lower than the former. It affords a very agreeable sight to observe the most limpid fluid penetrating the uppermost stratum of sand, perfectly similar to that oozing from the purest natural spring.

Professor Parrot remarks, that he procured a filtering machine made of block-tin, for ascertaining, by experiments, the purity and quality of water that may thus be obtained in a given time. It consisted of the following dimensions: the small diameter B, E, was eight Paris inches; the large of the whole machine, eleven inches; consequently the thickness of the vessel A, B, was one inch and a half; the breadth of it, two inches and seven-eighths. The perpendicular height of the lower side, from C, its basis, to the rim D, whence the water issues, was four inches and one-twelfth; the opposite height of the mouth A, B, eight inches and three-fourths; and the height of the sand on the side marked D, was three inches and one-sixth.

Although, in experiments of this nature, much depends on the relative size and purity of the sand, which necessarily afford different results, yet professor Parrot has, after repeated trials, deduced the following conclusions, which appear to be well founded.

1. That the difference of the *niveau*, or water-level, has an essential influence on the quantity of the purified water thus obtained. 2. That a prolongation of the stratum of sand does not considerably diminish the product of the filtre, but remarkably contributes to the purity of the fluid. 3. That if the water be forced to pass through the sand with increased velocity, it will be less pure than by allowing it a proper time for its passage; and, 4. That a machine of the dimensions above described will furnish about three quarts of water in an hour, or eighteen gallons in twenty-four hours. This quantity, however, being too large in proportion to the size of the machine, it is advisable, either to lessen the difference of the water-fall; or, which is still better, to prolong the stratum of sand, in order to reduce the filtration of the water to half the quantity above stated, and to obtain it in greater purity. Thus, a filtering apparatus eighteen inches long from A to D,

two inches thick, and four broad, would afford every hour six pints of very pure water. If, therefore, so small a machine, containing a very moderate stratum of sand, and requiring only a difference of two or three inches in the height of the water, furnishes a clear and pure fluid, it follows that an apparatus on a larger scale, provided with a bed of sand from five to six feet long, and admitting of a difference from twelve to eighteen inches in the fall of the water, might be usefully employed in public wells, hydraulic machines, and even in camps, for the supply of an army.

In the construction of large filtering machines, professor Parrot justly observes, that they should not be extended in the direction A, C, D, to a greater length than is absolutely necessary; as, in this case, they will not require any considerable difference in the fall and rise of the water: on the other hand, their breadth and thickness may be accordingly increased. Thus, the diameter of such a machine would still more resemble that of a syphon.

A very simple filtering apparatus may be easily made by any common carpenter. It is nothing more than a vessel of wood in form of a frustum of a square pyramid, of which the smaller end is to be downwards, and to have a grated bottom. Over this let there be laid a layer of charcoal, and upon that another of sand. The water thus strained through the sand and charcoal will be purified: and both sand and charcoal may be changed for fresh whenever the impurities they have detained are so accumulated as to render such change necessary.

Filter is also a charm, supposed to have a virtue of inspiring love. The word is derived from φιλτρον, which signifies the same thing, of φιλεω, *amo*, I love. The Greeks, when their love was without success, had several arts to procure the affections of their beloved. The Thessalian women were famous for their skill in this as well as other magical practices. The means whereby it was effected were of various sorts; it was sometimes done by potions called φιλτρα, which are frequently mentioned in authors of both languages. Juvenal speaks thus:

> "Hic magicus affert cantus, hic Thessala vendit
> Philtra, quibus valeant mentem vexare mariti."

Their operations were violent and dangerous, and commonly deprived such as drank them of their reason. Plutarch and Cornelius Nepos report, that Lucullus, the Roman general, first lost his reason, and afterwards his life, by one of them.

FILTERING STONE. See Marmor and Arenarius.

FILTH. *s.* (ꝼılð, Saxon.) 1. Dirt; nastiness (*Sandys*). 2. Corruption; grossness; pollution (*Tillotson*).

FI'LTHILY. *ad.* (from *filthy.*) Nastily; foully; grossly (*L'Estrange*).

FI'LTHINESS. *s.* (from *filthy.*) 1. Nastiness; foulness; dirtiness (*Sidney*). 2. Corruption; pollution (*South*).

FI'LTHY. *a.* (from *filth.*) 1. Nasty; foul; dirty (*Shakspeare*). 2. Gross; polluted (*Dryden*).

To **FI'LTRATE.** *v. a.* (from *filter.*) To strain; to percolate (*Arbuthnot*).

FILTRATION, a process employed in pharmacy and chemistry to separate fluids from substances suspended in them. In many instances this is performed by throwing the whole upon a conical bag made of any porous materials, such as flannel, linen or paper, which detains the solid part, and allows the fluid to pass through clear. When the quantity of materials is large, and the solid of a nature not easily to be suspended in water, a flannel or linen bag is preferable, as being more expeditious than paper; and of flannel or linen the latter is most advantageous where the liquor is required to be preserved, as the former is apt to soak up a large quantity; while, when the solid residue is the only valuable part, as in filtrating the citrat of lime, formed by chalk and lemon juice, flannel answers as well, and is more speedy.

In small quantities, and where accuracy is required, the material of the filter is generally a square, thin, unsized paper, first doubled from corner to corner, into a triangle, and the latter again doubled into half the size, making another triangle. This when opened forms a paper cone, into which the liquor is poured, and which must be supported by being put into a glass funnel.

The substances that cannot be filtered in the common way are those which act too powerfully upon the paper and other materials employed. The concentrated acids and alkaline solutions are of this kind. Where it is required to filter these, which is not often the case, they must be poured through a stratum of coarsely powdered glass, or well washed white sand, in a glass funnel.

FI'MBLE HEMP. *s.* (corrupted from *female.*) The light summer hemp, that bears no seed, is called *fimble hemp* (*Mortimer*).

FIMBRIÆ. (*fimbria, quasi finibria,* from *finis*, the extremity.) In anatomy. The extremities of the Fallopian tubes.

FIMBRIATE, in botany; Fringed, which see.

FIN, in natural history, a well known part of fishes, consisting of a membrane supported by rays, or little bony or cartilaginous ossicles.

The number, situation, and figure of fins, are different in different fishes. As to number, they are found from one to ten, or more; with respect to situation, they stand either on the back only, the belly only, or on both; and as to figure, they are either of a triangular, roundish, or oblong square form. Add to this, that in some they are very small; whereas, in others, they are almost equal to the whole body in length.

Fin-fish, in ichthyology. See Balæna.

Fin-footed. *a.* Palmipedous; having feet with membranes between the toes (*Bro.*).

FI'NABLE. *a.* (from *fine.*) That admits a fine; that deserves a fine (*Hayward*).

FINÆUS (Orontius), or **Fine'**, professor of mathematics in the Royal college at Paris. He was born in 1494, and early distinguished himself by a turn for philosophy and mathematics. But, notwithstanding his great reputation, he lived all his life in poverty, and left a family greatly distressed. He died in 1555. His works were printed in 3 vols. 4to.

FI'NAL. *a.* (*final*, French.) 1. Ultimate; last (*Milton*). 2. Conclusive; decisive (*Davies*). 3. Mortal; destructive (*Spenser*). 4. Respecting the end or motive (*Collier*).

Final cause. See Cause.

Final letters, among Hebrew grammarians, five letters so called, because they have a different figure at the end of words from what they have in any other situation. These are caph, mem, nun, phe, tzade, all comprehended in the word camnephatz, and which, at the end of words, are written thus, ץ, ף, ן, ם, ך; whereas, in any other situation, their form is thus, צ, פ, נ, מ, כ; on which account they are like wise called biform. Many of the modern oriental alphabets have, in like manner, different figures for several of their letters when finals: the Arabic alphabet gives a different form to almost every letter regarded as initial, final, or connected.

Final, a town of Genoa, in Italy, seated on the shore of the Mediterranean. It was sold to the Genoese by the emperor Charles VI. in 1713. It is 30 miles S.W. of Genoa. Lat. 44. 14 N. Lon. 8. 4 E.

FINALE, a town of Italy, in the Modenese. Lat. 44. 46 N. Lon. 11. 25 E.

Finale. (Italian.) A word signifying the last composition performed in any act of an opera, or part of a concert. (*Busby*).

F IN ALT, in music, the seventh above G in alt.

FI'NALLY. *ad.* 1. Ultimately; lastly; in conclusion (*Milton*). 2. Completely; without recovery (*South*).

FI'NANCE. *s.* (French.) Revenue; income; profit (*Bacon*).

FI'NANCIER. *s.* (French.) One who collects or farms the public revenue.

FI'NARY. *s.* (from *to fine.*) The second forge at the iron mills.

FINCH. *s.* (ꝼinc, Saxon.) A small bird of which we have three kinds, the goldfinch, chaffinch, and bullfinch. See Fringilla.

To **FIND.** *v. a.* (ꝼẏnꝺan, Saxon.) 1. To obtain by searching or seeking (*Milton*). 2. To obtain something lost (*Shakspeare*). 3. To obtain something desired (*Milton*). 4. To meet with; to fall upon (*Pope*). 5. To know by experience (*Cowley*). 6. To come to; to attain (*Milton*). 7. To discover by study (*Dryden*). 8. To discover what is hidden (*Cowley*). 9. To hit on by chance; to perceive by accident (*Cowley*). 10. To gain by any mental endeavour (*Pope*). 11. To remark; to observe (*Milton*). 12. To detect; to deprehend; to catch (*Locke*). 13. To reach; to attain *Job*). 14. To meet (*Cowley*). 15. To settle; to fix any thing in one's own opinion (*Cowley*). 16. To determine by judicial verdict (*Shakspeare*). 17. To supply; to furnish (*Bacon*). 18. (In law.) To approve; *as, to* find *a bill.* 19. *To* Find *himself.* To be; to fare with regard to ease or pain (*L'Estr.*). 20. *To* Find *out.* To unriddle; to solve (*Ecc.*). 21. *To* Find *out.* To discover something hidden (*Newton*). 22. *To* Find *out.* To obtain the knowledge of (*Dryden*). 23. *To* Find *out.* To invent; to excogitate (*Chronicles*).

FI'NDER. *s.* (from *find.*) 1. One that meets or falls upon any thing (*Shakspeare*). 2. One that picks up any thing lost (*Crashaw*).

FINDFA'ULT. *s.* (*find* and *fault.*) A censurer; a caviller (*Shakspeare*).

FINDHORN, a river of Scotland, which rises in Invernessshire, and crossing Nairneshire and the N.W. corner of Murrayshire, forms a bay, to which it gives name, and which opens into the frith of Murray, at the town of Findhorn.

FI'NDY. *a.* (ꝼẏnꝺiᵹ, Saxon.) Plump; weighty; firm; solid: not used (*Junius*).

FINE. *a.* (*finne*, French.) 1. Not coarse (*Spenser*). 2. Refined; pure; free from dross (*Ezra*). 3. Subtile; thin; tenuous (*Bacon*) 4. Refined; subtilely excogitated (*Temple*). 5. Keen; thin; smoothly sharp *Bacon*). 6. Clear; pellucid; transparent (*Johnson*). 7. Nice; exquisite; delicate (*Davies*). 8. Artful; dexterous (*Bacon*). 9. Fraudulent; sly; knavishly subtle (*Spenser*). 10. Elegant; beautiful in thought or language (*Dryden*). 11. Beautiful with dignity. 12. Accomplished; elegant of manners (*Felton*). 13. Showy; splendid (*Swift*).

Fine. *s.* (*fin*, Cimbr.) 1. A mulct; a pecuniary punishment (*Davies*). 2. Penalty (*Shakspeare*). 3. Forfeit; money paid for any exemption or liberty (*Pope*). 4. The end; conclusion (*fin*, Fr.) (*Sidney*).

Fine, in law, hath various applications. Sometimes it is used for a formal conveyance of lands or tenements, or of any thing inheritable, being in *esse temporis finis*, in order to cut off all controversies. Others define it to be a final agreement between persons, concerning any lands or rents, &c. of which any suit or writ is depending between them in any court.

Fine, sometimes signifies a sum of money paid for entering lands or tenements let by lease; and sometimes a pecuniary mulct for an offence committed against the king and his laws, or against the lord of the manor.

Fines for alienation, in feodal law; one of the attendants or consequences of tenure by vassalship. Knight-service, according to Blackstone, was that of fines due to the lord for every alienation, whenever the tenant had occasion to make over his land to another. This depended on the nature of the feodal connection, it not being reasonable nor allowed, that a feudatory should transfer his lord's gift to another, and substitute a new tenant to do the service in his own stead, without the consent of the lord: and, as the feodal obligation was considered as reciprocal, the lord also could not alienate his seignory without the consent of his tenant, which consent of his was called an attornment. This restraint upon the lord soon wore away; that upon the tenant continued longer. For when every thing came in process of time to be bought and sold, the lords would not grant a licence to their tenants to aliene, without a fine being paid; apprehending that, if it were reasonable for the heir to pay a fine or relief on the renovation of his paternal estate, it was much more reasonable that a stranger should make the same acknowledgment on his admission to a newly-purchased feud.

To FINE. *v. a.* (from the adjective.) 1. To refine; to purify (*Job*). 2. To embellish; to decorate: not used (*Shakspeare*). 3. To make less coarse (*Mortimer*). 4. To make transparent (*Mortimer*). 5. To punish with pecuniary penalty (from the substantive) (*Locke*).

To FINE. *v. n.* To pay a fine (*Oldham*).

To FI'NEDRAW. *v. a.*(*fine* and *draw.*) One whose business is to sew up a rent.

FINE-DRAWING or RENTERING, a dexterous sewing up or rejoining the parts of any cloth, stuff, or the like, torn or rent in the dressing, wearing, &c. It is prohibited to fine-draw pieces of foreign manufacture upon those of our own, as has formerly been practised. See RENTERING.

FI'NEFINGERED. *a.* (*fine* and *finger.*) Nice; artful: exquisite (*Spenser*).

FI'NELY. *ad.* (from *fine.*) 1. Beautifully; elegantly (*Addison*). 2. Keenly; sharply; with a thin edge or point (*Peacham*). 3. Not coarsely; not meanly; gayly (*Bacon*). 4. In small parts; subtilely; not grossly (*Boyle*).

FI'NENESS. *s.* (from *fine.*) 1. Elegance; beauty; delicacy (*Sidney*). 2. Show; splendour; gayety of appearance (*Decay of Piety*). 3. Subtilty; artfulness; ingenuity (*Shaksp.*). 4. Purity; freedom from dross or base mixtures (*Bacon*).

FI'NER. *s.* (from *fine.*) One who purifies metals (*Proverbs*).

FI'NERY. *s.* (from *fine.*) Show; splendour of appearance; gayety of colours (*Southern*).

FINERY, in the iron works, is one of the two forges at which they hammer the sow or pig iron.

Into the finery they first put the pigs of iron, placing three or four of them together behind the fire, with a little of one end thrust into it; where, softening by degrees, they stir and work them with long bars of iron, and expose at different times the different parts to the blast of the bellows, in order to refine it as equally as possible, till the metal runs together with a round mass or lump, which they call a half-bloom. They then take this out, and give it a few strokes with their sledges; afterwards they carry it to a great heavy hammer, raised by the motion of a water-wheel; where, applying it dexterously to the blows, they presently beat it out into a thick short square. This they put into the finery again, and heating it red-hot, they work it out under the same hammer till it comes to be in the shape of a bar in the middle, but with two square knobs at the ends, which they call an ancony. It is then carried into the other forge called the chafery.

FINEERING. See VENEERING.

FINE'SSE. *s.* (French.) Artifice; stratagem.

FI'NGER. *s.* (ꝼinᵹen, Saxon.) 1. The flexible member of the hand by which men catch and hold (*Keil*). 2. A small measure of extension; the breadth of a finger (*Wilkins*). 3. The hand; the instrument of work (*Wal.*).

To FI'NGER. *v. a.* (from the noun.) 1. To touch lightly; to toy with (*Grew*). 2. To touch unseasonably or thievishly (*South*). 3. To touch an instrument of musick (*Shakspeare*). 4. To perform any work exquisitely with the fingers (*Spenser*).

FINGER-BOARD, that thin, black covering of wood laid over the neck of a violin, violoncello, &c. on which, in performance, the strings are pressed by the fingers of the left-hand, while the right manages the bow.

FINGERED LEAF, in botany. See DIGITATE.

FINGERING, in music, the disposing of the fingers in a convenient, natural, and apt manner, in playing any instrument; but more especially the organ and piano-forte. Just and true fingering are of the first importance to the musician; but can scarcely ever be attained, particularly with regard to the abovementioned instruments, without the directions of a skilful master.

FI'NGLEFANGLE. *s.* (from *fangle*). A trifle; a burlesque word (*Hudibras*).

FINGRIGO, in botany. See PISONIA.

FI'NICAL. *a.* (from *fine.*) Nice; foppish (*Shakspeare*).

FI'NICALLY. *ad.* Foppishly.

FI'NICALNESS. *s.* (from *finical*). Superfluous nicety; foppery.

FINING. See CLARIFICATION.

To FI'NISH. *v. a.* (*finir*, French.) 1. To bring to the end purposed; to complete (*Luke*). 2. To make perfect (*Broome*). 3. To perfect; to polish to the excellency intended (*Blackmore*). 4. To end; to put an end to.

FI'NISHER. *s.* (from *finish.*) 1. Performer; accomplisher (*Shakspeare*). 2. One that puts an end; ender (*Hooker*). 3. One that completes or perfects (*Milton*).

FINISTERRE, the most westerly cape or promontory of Spain, in 9. 17 W. lon. and 42. 51 N. lat. This cape is likewise the most westerly part of the continent of Europe.

FINISTERRE, a department of France, which includes part of the late province of Bretagne. Its name corresponds to our word, the Land's End, it being the most westerly part of France. Quimper is the episcopal town.

FI'NITE. *a.* (*finitus*, Latin.) Limited; bounded; terminated (*Brown*).

FI'NITELESS. *a.* (from *finite.*) Without bounds; unlimited (*Brown*).

FI'NITELY. *ad.* (from *finite.*) Within certain limits; to a certain degree (*Stilling.*).

FI'NITENESS *s.* (from *finite.*) Limitation; confinement within certain boundaries (*Norris*).

FI'NITUDE. *s.* (from *finite.*) Limitation; confinement within certain boundaries (*Chey.*).

FINLAND, a province of Sweden, having the Gulph of Bothnia on the W. Russia on the E. the Gulph of Finland on the S. and Bothnia and Lapland on the N. The inhabitants differ from the Swedes, both in their manners and language. In the beginning of 1793, a tract of land, of the circumference of 392,000 Swedish ells, suddenly sunk to the depth of 15 fathoms.

FI'NLESS. *a.* (from *fin.*) Wanting fins.

FI'NLIKE. *a.* (*fin* and *like.*) Formed in imitation of fins (*Dryden*).

FI'NNED. *a.* (from *fin.*) Having broad edges spread out on either side (*Mortimer*).

FI'NNY. *a.* (from *fin.*) Furnished with fins; formed for the element of water (*Blackmore*).

FINOCHIO, in botany. See ANETHUM.

FINSCALE, in ichthyology. See CYPRINUS.

FINTO, a term in music, applied to the preparation for a cadence which is not executed.

FI'NTOED. *a.* (*fin* and *toe.*) Palmipedous; having a membrane between the toes (*Ray*).

FIONDA, an ancient episcopal town of Natolia, in Asiatic Turkey. Lat. 36. 45 N. Lon. 31. 57 E.

FIORENTINO, an episcopal town of Campagna di Roma, in Italy, belonging to the Ecclesiastical State. It is 44 miles S.E. of Rome. Lat. 41. 46 N. Lon. 13. 27 E.

FIORENZO (St). a maritime town of Corsica, near the gulph of the same name. Lat. 42. 35 N. Lon. 9. 20 E.

FI'PPLE. *s.* (from *fibula*, Latin.) A stopper (*Bacon*).

FIR-TREE. See PINUS.

FIRE. *s.* (ꝼyꞃ, Saxon.) 1. The igneous element (*Dryden*). 2. Any thing burning (*Cowley*). 3. A conflagration of towns or countries (*Gra.*). 4. Flame; light; lustre (*Shakspeare*). 5. Torture by burning (*Prior*). 6. The punishment of the damned (*Isaiah*). 7. Any thing that inflames the passions (*Shakspeare*). 8. Ardour of temper (*Atterbury*). 9. Liveliness of imagination; vigour of fancy; force of expression; spirit of sentiment (*Cowley*). 10. The passion of love (*Shadwell*). 11. Eruption or imposthumation: as, *St. Anthony's* fire. 12. *To set* FIRE *on*, or *set on* FIRE. To kindle; to inflame (*Taylor*).

To FIRE. *v. a.* (from the noun.) 1. To set on fire, to kindle (*Hayward*). 2. To inflame the passions; to animate (*Dryden*). 3. To drive by fire (*Shakspeare*).

To FIRE. *v. n.* 1. To take fire; to be kindled. 2. To be inflamed with passion. 3. To discharge any firearms (*Smith*).

FIRE, in natural philosophy. Combustion: the decomposition of combustible bodies accompanied with light and heat.

This definition agrees equally with the popular idea attached to the term, and the sense in which it is employed in modern science.

The word, however, has been used in various senses by philosophers of various schools; and hence, in works of close reasoning, has of late been generally exchanged for that of combustion; as a term affording a more definite meaning, and one less liable to mistake. See the article COMBUSTION.

Fire, under this view of the subject, is not a substance, but a quality. It supposes an igneous or combustible body; it supposes such body to be consuming or wasting away by a new action introduced into it; and it supposes this action to be attended with a copious emission of light and heat. All these may exist separately; but it is a compound operation resulting from the union of the whole that alone produces combustion or fire.

Heat may exist without fire, for water itself may be made to contain a very large portion of heat. In like manner, light may exist in a separate state; for many putrescent substances elicit light without any sensible change in their temperature; the female glow-worm secretes it from an organ near its tail, the fire-fly from its body generally, and the pausus sphærocerus from the globules of its antennas; yet the light thus secreted neither consumes the insect that secretes it, nor produces any sensible heat upon the object from which it is reflected. In the same manner the light of the moon is totally unconnected with fire; nor when collected by a convex lens into the most powerful focus do its rays manifest the least portion of sensible heat. The change produced in a combustible body in consequence of combustion, or its being set on fire, may also be produced by another cause, and occur without any emission of light or heat; but such a change cannot be called fire, because it takes place without the essential properties of fire, which are light and heat. It has, indeed, been called *slow combustion*, but even this term is highly incorrect; for though the result is the same, the phænomena of combustion do not enter into the change: and hence, this last effect has, with much more precision, been of late years denominated deoxydation. The only body we are acquainted with that possesses all these separate powers in itself is the sun: for the sun is now clearly ascertained to emit three distinct sets of rays; one set colorific, another calorific, and a third deoxydizing; and hence, by different contrivances, the sun may be made to enlighten without heating, to heat without enlightening, and to deoxydize without producing either of the other effects.

Under most of the old systems of philosophy, however, fire was employed not merely to express combustion, but in the sense in which the term heat or caloric is employed in the present day: and it was, on this account, necessary to distinguish the direct sense in which the term was used by some previous adjunct, and to describe it as elementary or latent, and sensible or actual: and by such philosophers it was regarded in the same manner as caloric is for the most part regarded among ourselves; as a substance *sui generis*, and not as a mere privation of cold in the ignited body. See the article CALORIC.

Such was the language of Democritus, Epicurus, and most of the Greek philosophers: and such was that of Boerhaave, Homberg, and Crawford before the term caloric was introduced into the philosophical vocabulary. It was conceived to be a simple substance reared from a combination of primordial atoms uniting in a peculiar mode, like any other simple substance, and rendered obvious or sensible by aggregation. This tenet of the Epicurean philosophy, however, was controverted by Aristotle and the Peripatetics, who maintained that there was no such thing as elementary fire, but that heat is in every instance produced by a commotion of the elementary particles of the heated body. This latter tenet, together with the general philosophy of Aristotle, descended to a very late period of European learning; it formed a part of the creed of Bacon, Boyle, des Cartes, and Newton; and after a sleep of nearly a century, has again been in some degree revived by count Rumford and Mr. Davy.

Fire in a sensible or collective state is well known to be one of the grandest agents of nature; and for this very reason, perhaps, was regarded amongst most nations in an early period of the world either as the creator and productive cause of all things, or, at least, as the substance from which the Creator produced all things. Hence the Persians, Ethiopians, Scythians, and Carthagenians, in the Old World, and the Mexicans and Peruvians in the New, paid divine honours to fire itself, or to the sun, which was esteemed the sublimest representation of this element. Zoroaster ordained the erection of pyrea or temples dedicated to fire throughout all Persia. And even the Hebrews imagined fire to be the grandest proof of the presence of the Deity. Under this symbol he appeared to Moses on Mount Horeb; and to the Hebrews at large on Mount Sinai, on the promulgation of the sacred law: and under this symbol he evinced his protective presence every night, by assuming the form of a fiery pillar. And, impressed with this idea, the Jews were ever anxious to preserve it in a pure and active flame upon the national altar. When, therefore, the Jews were borne away in captivity to Persia, the priests took the sacred fire of the altar and concealed it in a dry cave, with which none but themselves were acquainted; and where, on their restoration to liberty, the posterity of those priests found it on their return to Judea. (Maccab. ii. 1, 18.) Fire was regarded with an equal degree of veneration throughout Greece and Rome. Temples in every city were erected to the goddes Vesta—a name importing fire, whether derived from the Grecian ἑστια, or the Hebrew אשתא, and in every temple a lambent flame was perpetually burning over the altar. And even so late as in the third century of the Christian era, when Heliogabalus anticipated his own apotheosis, and instituted the worship of himself over all the Roman empire, having erected a magnificent temple to his own divinity, he supplied its altar with sacred fire from the temple of Vesta, which he plundered for this purpose.

We cannot be much surprised, therefore, that a belief so common among the people, should become a frequent doctrine among the philosophers; and that all things should be supposed to originate from fire as an element, instead of from fire as a god. Such was the opinion of Heraclitus, who rendered himself more celebrated than any other sage of the Pyrean school, by the eloquent but obscure and dogmatic manner with which he wrote upon this subject. In modern times, the same tenet has been frequently started afresh; and if not pressed to the full extent to which it was carried by Heraclitus, exhibiting such intimate marks of analogy and association as perpetually to remind us of the Heraclitæan system. Buffon supposed the whole earth to have been at first a complete body of liquid fire; and to have consisted of a comet, and a portion of the sun's exterior limb carried off by such comet, in consequence of its having given the sun an oblique stroke in the course of its orbit. At its first origin, therefore, the earth, upon this system, was nothing more than a large vitreous mass in a state of fusion. This state of fusion constituted the chaos of which every nation has some tradition: and from the chaotic mass, as it became gradually cool, the earth in its present state was progressively developed. He conceived this operation to have been the work of a multitude of ages, and endeavoured to reconcile the chronology of Moses with that of the Pundits of Hindustan, by conjecturing that while the former only begins his date from the period when the earth first became habitable, the latter calculate from the earliest origin of the globe in its state of liquid heat. To detail the arguments which have been adduced in opposition to this and similar systems would engross too much time, as well as paper. We refer the reader, therefore, to the works of Woodward, Whitehurst, Howard, and Kirwan.

Dr. Hutton published a theory of the earth about fourteen years ago, in the Edinburgh Philosophical Transactions, in which, after contending for the existence of an immense subterraneous fire in its center, he endeavours to prove that every substance in contact with this fiery mass is fused by its operation; and when fused, raised by the violence of its heat above the level of the sea: that all the continents we have discovered, and the most solid strata of which they consist, have been thus formed; that new continents are perpetually rearing in the same manner from the wasting particles of those at present existing; and that these new ones will ascend and appear hereafter, when those now existing shall have been entirely frittered away. This theory, which is in no small degree confused and inconsistent, has been attacked with ability and spirit by M de Luc and Mr. Kirwan, who attribute all the phænomena of nature to aqueous solution; a theory more minutely adverted to in various notes in Book V, of Lucretius, where the poet gives his own system of cosmology.

M. de Mairan has attempted to prove that the earth is infinitely more indebted for the heat it receives, to its own central fires, than to the rays of the sun. He allows that this latter, by adding some portion of heat to the surface of the earth, is the immediate cause of the vicissitude of the seasons; but asserts, that were it not for the continual ascent of an immense quantity of subterranean heat, though the sun were perpetually to illuminate two-thirds of the globe at once, with a heat equal to that at the equator, the entire orb would soon condense into one general mass of solid ice. His reasonings on this subject are too long and intricate for insertion. There is, however, much ingenuity in them, and they are to be found in the Hist. de l'Acad. des Sciences, l'ann. 1765. It is probably from this theory that Klopstock has drawn his beautiful machinery of an interior world in the earth's center, in which reside the guardian spirits of the globe, and the souls of departed saints: it is a paradise, where celestial breezes blow, eternal splendour smiles, and the Almighty communicates, in an especial manner, the wonders of his providence and grace to the beatified inhabitants. Here a sun, that never sets or rises, shines with pure and uninterrupted radiance: from the beams of which the surface of the earth itself is perpetually nourished and rendered fertile:

> Von ihr fliesst leben und wärme
> In die adern der erd empor. Die oberste sonne
> Bildet mit dieser vertrauten gehülfinn den blumigen frühling
> Und den feurigen sommer, von sinkinden halme belastet,
> Und den herbst auf traubengebirgen. In ihren bezirken
> Ist niemals auf, und niemals untergegangen.
> Messia's Ges.
>
> From him, through all the veins of upper earth,
> Life flows, and heat. The sun above by him,
> His fixt associate, aided, deck'd with flowers
> Rears the young spring, the fiery summer rears,
> Loaded with fruits, and autumn's vine-clad realm.
> The bright horizon he for ever gilds,
> Nor sets, nor rises.
> Good's Lucretius, Note on b. I. v. 693.

Under all these systems fire is contemplated as in a sensible state, in a state of fusion or of combustion; in both which it is, as we have already observed, rather a compound quality than an original and unigenous element.

The cause of this effect, the mode by which fire, as a quality, and more especially as a quality involving the three ideas of light, heat, and a wasting or consuming substance is produced, is a question that has not to this hour been satisfactorily settled. We have entered at some length into the history of the different opinions that have been held upon this subject down to the system of Lavoisier, in the article Combustion, and have there hinted at a few of the objections that were offered to this elegant hypothesis upon its first appearance. The chief of these is directed against the tenet, that the light and heat transmitted during combustion, or fire in the popular acceptation of the term, are derived from the oxygen gass that is separated in the course of the operation either from the combustible body, or the air, or some other auxiliary material acting upon it. The objection that appeared to be fatal to this tenet was that the oxygen employed is often in a liquid or even in a solid state, and yet that a greater quantity of light and caloric are emitted than when it is employed in a gasseous state; and the instances alluded to were combustion taking place, upon an union of nitric acid with the essential oils of vegetables; and the spontaneous firing of gunpowder in close vessels. The difficulty was at first attempted to be removed by Brugnatelli, who conjectured that oxygen combines with bodies in two distinct states—sometimes with, and at other times without, light and caloric: that in its gasseous form it always retains these two bodies: but by no means always when combined with solid substances, though whenever it does the same result must necessarily follow in both cases. The conjecture is plausible, but still it is conjecture alone, and as such has been very far from proving satisfactory to any one. In the Journal de Chimie of Mons. Vans, vols. II. and III. other explanations have been offered, but as little to the purpose. Finally, Dr. Thompson has proposed his improvement upon the theory, which is by far the best that has hitherto been advanced, but which we forbear to enlarge upon, as we have already noticed it under the article Combustion. See also the articles Light, Oxygen, Phlogiston.

Fire arms, are all sorts of arms charged with powder and ball, as cannon, musquets, carabines, pistols, blunderbusses, &c. See Cannon, Gun, &c.

Fire arrow, is a small iron dart, furnished with springs and bars, together with a match impregnated with powder and sulphur, which is wound about its shaft. It is used by privateers and pirates to fire the sails of the enemy, and for this purpose is discharged from a musket or a swivel-gun. The match being kindled by the explosion, communicates the flame to the sail, against which it is directed, where the arrow is fastened by means of its bars and springs. As this is peculiar to hot climates, particularly the West Indies, the sails being extremely dry, are instantly set on fire, and the fire is conveyed to the masts, rigging, and finally to the vessel itself.

Fire ball, in the art of war, a composition of meal-powder, sulphur, salt-petre, pitch, &c. about the bigness of a handgrenade, coated over with flax, and primed with a slow composition of a fusee. This is to be thrown into the enemy's works in the night time, to discover where they are; or to fire houses, galleries, or blinds of the besiegers; but they are then armed with spikes, or hooks of iron, that they may not roll off, but stick or hang where they are designed to have any effect.

Fire (Balls of), in meteorology, a kind of luminous bodies, generally appearing at a great height above the earth, with a splendour surpassing that of the moon; and sometimes equalling her apparent size. They generally proceed in this hemisphere from north to south, with vast velocity, frequently breaking into several smaller ones, sometimes vanishing with a report, sometimes not. These luminous appearances no doubt constitute one part of the ancient prodigies, blazing stars or comets, which last they sometimes resemble in being attended with a train; but frequently they appear with a round and well defined disk. The first of these, of which we have any accurate account, was observed by Dr. Halley and some other philosophers at different places, in the year 1719. From the slight observations they could take of its course among the stars, the perpendicular height of this body was computed at about seventy miles from the surface of the earth. The height of others has also been computed, and found to be various; though in general it is supposed to be beyond the limits assigned to our atmosphere, or where it loses its refractive power. The most remarkable of these on record appeared on the 18th of August, 1783, about nine o'clock in the evening. It was seen to the northward of Shetland, and took a southerly direction for an immense space, being observed as far as the southern provinces of France, and one account says, that it was seen at Rome also. During its course it appeared frequently to have changed its shape; sometimes appearing in the form of one ball, sometimes of two or more; sometimes with a train, sometimes without one. It passed over Edinburgh nearly in the zenith, and had then the appearance of a well defined round body, extremely luminous, and of a greenish colour; the light which it diffused on the ground giving likewise a greenish cast to objects. After passing the zenith it was attended by a train of considerable length, which continually augmenting, at last obliterated the head entirely; so that it looked like a wedge, flying with the obtuse end foremost. The motion was not apparently swift, by reason of its great height; though in reality it must have moved with great rapidity, on account of the vast space it travelled over in a short time. In other places its appearance was very different. At Greenwich we are told, that two bright balls parallel to each other led the way, the diameter of which appeared to be about two feet; and were followed by an expulsion of eight others, not elliptical, seeming gradually to mutilate, for the last was small. Between each two balls, a luminous serrated body extended, and at the last a blaze issued which terminated in a point. Minute particles dilated from the whole. The balls were tinted first by a pure bright light, then followed a tender yellow, mixed with azure, red, green, &c.; which, with a coalition of bolder tints, and a reflection from the other balls, gave the most beautiful rotundity and variation of colours that the human eye could be charmed with. The sudden illumination of the atmosphere, and the form and singular transition of this bright luminary, tended much to make it awful; nevertheless, the amazing vivid appearance of the different balls, and other rich connective parts, not very easy to delineate, gave an effect equal to the rainbow in the full zenith of its glory.

Ingenious men have proposed various hypotheses to account for these phenomena. See Aeroliths.

FI'REBRAND. *s.* (*fire* and *brand.*) 1. A piece of wood kindled (*L'Estrange*). 2. An incendiary; one who inflames factions; one who causes mischief (*Bacon*).

FI'REBRUSH. *s.* The brush which hangs by the fire to sweep the hearth (*Swift*).

FIRE-COCKS, cocks fixed into pipes at proper positions, from which water may be drawn for the purpose of extinguishing fires. Church-wardens in London, and within the bills of mortality, are to fix fire-cocks at proper distances in streets, and written marks near them, and to keep in every house thus marked an instrument or key for opening the plug, and a large engine, and hand-engine for extinguishing fire, under the penalty of 10l.

All the laws relating to the prevention, &c. of fire, are reduced into one statute, and former statutes repealed, by 12 Geo. III. cap. 73.

Fire-eater, one who pretends to eat fire. We have a great number of mountebanks who have procured the attention and wonder of the public, by eating of fire, walking on fire, washing their hands in melted lead, and the like tricks. The most celebrated of these was our countryman Richardson, much talked of abroad. His secret as related in the Journal des Sçavans, of the year 1680, consisted in a pure spirit of sulphur, wherewith he rubbed his hands, and the parts that were to touch the fire which burning and cauterising the epidermis, hardened and enabled the skin to resist the fire.

Fire-engine, is a machine for extinguishing accidental fires by means of a stream or jet of water. The common squirting fire engine consists of a lifting pump placed in a circular or cylindric vessel of water, and wrought by two leavers that act always together. During the stroke, the quantity of water raised by the piston of the pump spouts with force through a pipe joined to the pump-barrel, and made capable of any degree of elevation, by means of a yielding leather pipe, or by a ball and socket turning every way, screwed on the top of the pump. The vessel containing the water is covered with a strainer, which prevents the dirt and filth poured into it with the water from choaking the pump-work. Between the strokes of this engine the stream is discontinued, for want of an air vessel.

The late improvements made on fire engines have been very great; but as we cannot pretend to specify them all, we shall merely describe one or two engines of the best construction; at the same time admitting that others which we do not even mention have their respective degrees of merit. The engine invented by Rowntree and Co. is very ingenious on many accounts, as the reader will judge from the following descriptions.

Fig. 1, in plate 69, presents an end view of the working part of this engine, supposing the engine cut down the middle A is a metal cylinder. B a piston or plunger acting in a circular direction by means of the levers CC, fixed upon the ends of its axis DD, the lower valve boxes on the outside the cylinder, with each a valve EE. These boxes are large, and so constructed as to prevent the metal cylinder being clogged up with gravel, sand, or other dirt, which frequently is the cause of other engines being useless after working a short time. These boxes have each a clack door on the outside, which screws off, for the convenience of taking out the gravel, sand, or other dirt which may have collected there; by which means the engine is always kept in a working state.

These clack-doors are shewn at A, fig. 2. E the upper box with its valves FF. G the air-vessel. H the discharge pipe, and I the pipe that conveys the water to the engine, commonly called the suction pipe.

Fig. 3. represents a side view of the working parts. A the metal cylinder. B the piston and axle. F the upper valve box. HH the discharge pipes covered with caps KK, which screw off when the engine is played, and the leather pipes and branches are screwed on. G the air-vessel. H the suction pipe. L, L, L, L, springs fixed to the side of the wood cistern. Fig 4. is a perpendicular view, where AA represents the cylinder, B the piston and axle. D, D, the valve boxes. C, C, C, C, C, C, C, C, the levers fixed on the piston, axle, and connected by the bars P P: O O being the bearings for the piston axle. At Fig. 2, the engine in profile with its handle, &c. ready for working. M a wooden cistern. L, L, L, L, four springs firmly fixed to the side of the cistern on which the levers C, C, C, &c. strike. In working, these springs help to return the stroke, so that the arms of the men employed are effectually relieved from that heavy shock attendant on the use of other engines. P the bars which connect the levers C, C, C, &c, and at a small distance from which the wooden handles N, N, are fixed. K, K, the caps on the discharging pipes, which are to be taken off, in order to fix on the leather pipe or branches, when the engine is to be put in action. On trial, this engine has given very great satisfaction.

A very ingenious and useful fire engine, invented by Mr. Benj. Dearborn, is described in the Trans. of the American Academy, for 1794: we extract the following particulars.—Fig. 6, plate

69, A B, and C D, are the edges of two planks, confined together by four bolts: *a b*, and *c d*, are two cylindrical barrels, in each of which a piston, with a valve, is fastened to the spear *e*, and is moved up and down alternately by the motion of the arms E E. Beneath each barrel a hole is made through the plank A B, which is covered with a valve. The arms E E, are suspended on the common centre *f*: there are also arms parallel to these on the opposite side; *g g* are the ends of the handles which are fastened across the ends of the arms. At *h* a bolt goes across, from arm to arm, to which the piece *i*, *k*, is affixed, and on which it plays; the lower end of this piece is fastened to the top of the spear *e*.—G, *l*, *f*, is a standard for the purpose of supporting the arms, to which there is a correspondent one on the opposite side; both are notched into the edges of the planks, where they are secured by a bolt, which passes through them at *l*, and has a nut or forelock on the opposite side. H I, H I, are square braces, answering the purpose of ducts, through which the water ascends from the barrels, passing through the plank at *m*.—K L, K L, are irons in the form of a staple, in order to confine the braces: the lower ends of these irons meet, and are secured by a bolt passing through them, and M N, *n o*, which is a piece that goes up through a mortice in the centre of the planks. This piece is square from the lower end, till it reaches the top of the braces; whence they become cylindrical to the top, the upper end being perforated sufficiently low down, in order to communicate with the braces. O P, is an iron ring, that surrounds the tube, and has two shanks which ascend through the head, with screws on the top at *p*, *q*:—*r*, *s*, is a ferule nailed round the tube.

Fig. 7. is the same engine; the arms and standards being taken off, in order to delineate more clearly the mode of securing the braces; an object which is completely effected by a wedge driven into the mortice *a*: beneath the upper plank *b*, is a hole for admitting a passage to the bolt, which secures the standards. In this figure, a side view of the head is given, with the pipe in a perpendicular direction.

The machine is confined within a box, set on wheels, as in the common fire-engines. The whole is made of wood, excepting the spears of the pumps, and a few bolts, &c. The advantages of this machine are, that it can be made in any place where common pumps are manufactured; the interior work will not exceed one-fourth of the price of those which are constructed on the usual plan; and that they are incomparably more easy to work, than the common ones; circumstances which strongly recommend the American fire-engine to the attention of the public.

Fire-escape, a contrivance for the purpose of rescuing persons in imminent danger from fire.

The following is a description of some machines for that purpose, sent to the Lyceum of Arts, that the commission appointed to examine them might ascertain which of them might be executed on a large scale, and promised to answer the public expectation.

The first, which is raised by means of simple parallelograms, supports, at its upper extremity, a pulley, into which passes a cord, whereby men, stationed on the carriage, raise and lower a basket intended to receive the persons who are in danger; but the author has not considered, that when this basket is charged, such a weight at the extremity of the parallelograms would be too great, and would infallibly break them: besides, when thus suspended, it would be impossible to bring off the sick and infirm.

The second machine consisted of a vehicle on four wheels; on planks across it are fixed the two first uprights, to which is attached a jointed ladder, in an inclined position; and which is folded together when the machine is removed. Two other uprights, placed about two-thirds of the length of the vehicle, hold a grooved-frame, in a vertical position, intended to support the ladders, when unfolded at their length, from the front to the hind-part of the carriage; being in length twenty metres, and inclined forty-five degrees; so that in this position they rise in vertical height thirteen metres, or about forty feet.

To the top of the last ladder is fixed a platform, for the purpose of receiving the sufferers. But this platform, when charged, would break the ladder if it had not some support; for this purpose the inventor has ingeniously contrived a framing, that rises vertically up to the platform. This framing stands on grooved planks, that cross the back part of the carriage, in such a manner, that, if the ladders are unfolded only in part, the framing rises more horizontally in proportion, to support the platform.

Along this inclined ladder mounts a basket or box, by means of a cord that passes into a pulley attached to the top of the platform. This cord is pulled by men, stationed in the body of the vehicle. The chest or box sliding the whole length of the ladder, is calculated to afford a facility of escape to the unfortunate persons, whose strength on these occasions cannot be depended on.

The principal defect of this machine is that of unfolding the ladders by means of cords, that are so liable to be entangled, and which, in moments so urgent as those of fire, might be attended with the most melancholy consequences.

Another, not less material defect, is that of attaching the platform to the top of the ladder; this platform would bend the whole ladder by its weight, and would strain the iron rods; it would be more adviseable to affix it to the upper part of the hinder framing. This machine, upon the whole, seemed too complicated.

The third is made by the same hand, and is constructed in a waggon, of common width, four metres in length. From the middle of it rise two uprights, four metres in height, and firmly fixed; their top supports an axis.

A frame, turning on this axis, is placed horizontally when the machine is removed, and vertically for actual use. Along it are folded two other frames, which, when extended in a vertical position, rise to the height of sixteen metres, or about fifty feet, a height sufficient to reach the loftiest parts of houses. The parts of this framing are extended, by means of two cords, with pulleys, each of them being pulled by one man; in the sides of this framing are placed two hooks, by which it is fixed at the height required.

The top supports a platform, which is firmly fastened to it; but as the frame rises to such a great height, the platform, when charged, would, from its unsteadiness, be extremely dangerous, had not the inventor ingeniously adapted two strong brass wires behind, and two others in the front of this platform. The two first run in a parallel direction to a capstan, placed in the back part of the waggon, and the two others to a capstan in the front; by means of which the requisite tension is given to the cords, and they firmly keep the framing vertical, in the same manner as the shrouds of a ship secure the masts in their position. These brass wires are very strong, and give the necessary security to the platform, which will thus carry several persons without any danger of tottering; it may even be relied upon, that it is kept in its position as steadily as it could be by woodwork. But these brass wires serve for another purpose; they are intended for the chests or vehicles to slide down from the top of the platform to the bottom of the waggon, and ascend in the same manner by means of cords that pass two pulleys, adapted to the platform; the cord of the chest belonging to the rear of the waggon is pulled by a capstan, fixed in the bottom of the waggon, and another by a wheel, which serves to regulate the velocity in descending.

This chest, raised to the platform, is particularly intended to receive the unfortunate people ready to perish in the flames, the women, the children, and the infirm, who are to be placed on steps made in the chest, which will descend down the brass wires, in an inclined plane, without swing or shock: when landed at the bottom of the waggon, it is opened before, and every assistance given the sufferers.

The second chest, which is in the front of the waggon, is raised in the same manner to the top of the platform by means of a cord that passes into a pulley, adapted to the said chest; which cord is to be pulled by one or two men.

This second chest, which contains steps like the first, is for raising up to the platform the persons employed on the occasion; it may likewise be used in any exigency, for the same purpose as the first.

These chests have rails to assist in descending into the inside, and hold two or three persons: each of them is provided with four strong iron staples, through which pass the brass wires, thus keeping them perfectly steady in their course.

The platform has parapets, which fit to it according to whichever side it is necessary to place the temporary bridge, thrown across to the window of the house that is on fire; this bridge is strongly fastened to the window by means of grappling irons, and is provided with rails. But on those sides of the parapet on which the chests land, the ingenious inventor has contrived swinging gates, with parapets above them, which are pushed aside by the chest at the moment of its arrival; thus combining all the security and dispatch that can be desired.

But as too much facility cannot be given to the firemen in ascending, the artist has added a rope-ladder, fastened at top to one of the upper cross-beams of the waggon; this is joined by a ladder of wood, which stands on the bottom of the carriage. These two ladders will afford the firemen every facility to ascend with celerity to the platform. This rope-ladder might likewise be fastened to the platform on the contrary side to the fire. The waggon will be kept in its position by blocks placed under the wheels.

Instead of ropes, the above ladder, if it may be thought proper, may be made of brass, with steps of wood: as rope steps are rather difficult of ascent. The frame of the machine will serve to support the leather pipes, without detriment to its working.

When constructed on a large scale, this machine must be made of deal, particularly the frame, and likewise the bottom of the waggon. The wheels must be sufficiently strong, and of common wood; the chests of wood and ozier, and lined with velvet.

All the upper parts must be of iron, with their apparatus; the platform may be lined with iron plates underneath, to preserve it from fire. The inventor has likewise contrived an apron or skreen, also of plate iron, fitted to, and suspended before this platform, towards the house, to secure the whole of the upper part of the machine against the fury of the flames

The commission of the Lyceum, conceiving that this machine may be executed on a large scale, and that it is calculated to answer every purpose for which it is intended, as a recompence for his labours, decreed M. Daujon a medal and a crown, at one of their late public sittings, for the invention.

A fire-escape, invented by a Mr. Maseres, is described in the 105th number of the Philosophical Magazine, or number 8 of the Retrospect. But we think it too complex for general adoption.

The method of descent by a rope, and the rapidity of motion impeded by friction, has been long known; and the oldest contrivance we remember of this nature is, we think, equal, if not superior, to Mr. Maseres's. It is described by the celebrated Galileo, in his Mechanical Dialogues, as practised by a friend of his, and is this: about a cylinder of two inches thick, and eight or ten long, he cut a notch spirally, of one turn and a half, and no more, big enough to receive the cord he designed to use, and which he put into the notch at the upper end, and brought out at the lower; afterwards he enclosed that cylinder and cord in a wooden, or rather, a tin tube, made with clasps or hinges to open or shut lengthways at pleasure. Then, having made fast the rope above, grasping the tin case with both his hands, he hung by his arms; whence, such was the compression of the cord between the ambient tube and the cylinder, that he could stop himself at pleasure by clenching his hands closer, and by loosening his hold a little, he could let himself down gently as he pleased.

If a stirrup for each foot were attached with sufficient strength to the tin case, as it might easily be, we conceive a descent by this contrivance would be far preferable to that by Mr. Maseres's: and if by any accidental circumstance the motion of the cylinder and tin case should be completely stopped, the person descending would only have to take his feet out of the stirrups, when he might slide down the rope in the usual way; whereas in Mr. Maseres's fire-escape, if a knot or other obstacle in the rope should prevent its drawing through the holes in the regulator, the person descending, having previously buckled himself in, is kept suspended in a situation little, if at all, better than the one he had just left in the consuming house. But both these contrivances, it must be observed, are liable to the objection of the person bruising himself against the wall of the house as he descends.

On this occasion we would beg leave to point out the great utility of these fringed ropes, which should be fastened to the foot of a bedstead, and extend to a sufficient length to allow of a person's descending by them, through a window, in case of fire. The custom of keeping long rope ladders in bed-rooms must also be strongly recommended to general adoption.

Method of extinguishing Fire in Chimneys.—It is well known that the inner parts of chimneys easily take fire; the soot that kindles therein emits a greater flame, according as the tunnel is more elevated, because the current of air feeds the fire. If this current could therefore be suppressed, the fire would soon be extinguished. In order to this, some discharge a pistol into the chimney, which produces no effect. Water thrown into the chimney at top is equally useless, because it comes down through the middle of the tunnel, and not along the sides. It would be more advisable to stop, with a wet blanket, the upper orifice of the tunnel: but the surest and readiest method is to apply the blanket either to the throat of the chimney, or over the whole front of the fire-place. If there happens to be a chimney-board or a register, nothing can be so effectual as to apply them immediately; and having by that means stopped the draught of air from below, the burning soot will be put out as readily and as completely as a candle is put out by an extinguisher, which acts exactly upon the same principle.

Compositions for extinguishing Fire.—Mr. William Knox, of Gothenburg, in Sweden, made many experiments with compositions for this purpose. He divides them into simple and compound solutions. In the former class, he proposes to add to 75 gallons of water, 9 gallons of the strongest solution of wood ashes; or 6 gallons of the finest pulverized pot-ashes; or 8¼ gallons of common salt, well dried, and finely beaten; or 8¼ gallons of common vitriol or copperas, thoroughly dried and finely pulverized; or 11½ gallons of the strongest herring-pickle; or 9 gallons of alum reduced to powder; or 19 gallons of clay, perfectly well dried, well beaten, and carefully sifted.

Among the compound solutions, Mr. Knox recommends to mix 75 gallons of water with 10 quarts of clay, 10 quarts of vitriol, and 10 quarts of common salt; or a similar quantity of water, with 18 quarts of the strongest solution of wood-ashes and 18 quarts of fine clay reduced to powder; or the same proportion of water, with 15 quarts of red-ochre, or the residuum of aquafortis, and 15 quarts of common salt: or, lastly, to mix 15 quarts of the strongest herring-pickle, and 15 quarts of red-ochre, with 75 gallons of water. All these different solutions, Mr. Knox remarks, are equally efficacious in extinguishing fire; but he prefers the compounds, as being the "surest and most powerful for that purpose."

Another of the various inventions for extinguishing fire by chemical means, deserving of notice, is the composition prepared by M. Von Aken, and which consists of the following ingredients:

	lbs.
Burnt alum	30
Green vitriol in powder	40
Cinabrese, or red-ochre, pulverized	20
Potters', or other clay, finely pounded and sifted	200
Water	630

With 40 measures of this liquor an artificial fire, which would have required the labour of twenty men, and 1500 measures of common water, was extinguished, under the direction of the inventor, by three persons. The price of this compound solution is estimated at one halfpenny per pound. See farther on this subject Gregory's Mechanics, vol. ii. pp. 178—182.

Fire-flair, in ichthyology. See Raja.

Fire-fly, in entomology. See Lampyris.

Fire-lock, a small gun, which is placed against a man's shoulder, and fired by means of a flint communicating a spark to powder in a receptacle pan, or lock.

Fire-man, 1. one who is employed to extinguish burning houses. 2. A man of violent passions.

Fi'renew, *a.* New from the forge; new from the melting-house (*Shakspeare*).

Fi'repan. *s.* (*fire* and *pan.*) 1. A pan for holding fire (*Bacon*). 2. [In a gun.] The receptacle for the priming powder.

Fire-office, an office for insurance from fire. See Assurance and Insurance.

Fire-places, are contrivances for communicating heat to rooms, as well as for answering various purposes of art and manufacture. See Chimney, Furnace, and Stove.

On the subject of the most beneficial form in which common fire-places may be constructed, the public have been lately instructed, in a valuable essay by the ingenious count Rumford:

"All chimney fire-places (says the author) without exception, whether they are designed for burning wood or coals, and even those which do not smoke, as well as those which do, may be greatly improved by making the alterations in them here recommended; for it is by no means merely to prevent chimneys from smoking that these improvements are recommended, but it is also to make them better in all other respects as fire places; and when the alterations proposed are properly executed, which may very easily be done with the assistance of the following plain and simple directions, the chimneys will never fail to answer, I will venture to say, even beyond expectation. The room will be heated much more equally and more pleasantly, with less than half the fuel used before; the fire will be more cheerful and more agreeable; and the general appearance of the fire-place more neat and elegant, and the chimney will never smoke."

The author having stated, that these advantages will be derived merely from diminishing the capacity of the throat of the chimney, or that part just above the fire-place, proceeds to give the following explanation of the technical terms which he finds it necessary to use:

"By the throat of a chimney (says he) I mean the lower extremity of its canal, where it unites with the upper part of its open fire-place. This throat is commonly found about a foot above the level of the lower part of the mantle; and it is sometimes contracted to a smaller size than the rest of the canal of the chimney, and sometimes not. In Plate 70, fig. 5 shows the section of a chimney on the common construction, in which *d e* is the throat. Fig. 6 shows the section of the same chimney altered and improved, in which *d i* is the reduced throat.

"The breast of a chimney is that part of it which is immediately behind the mantle. It is the wall which forms the entrance from below into the throat of the chimney in front, or towards the room. It is opposite to the upper extremity of the back of the open fire-place, and parallel to it; in short, it may be said to be the back part of the mantle itself. In the figures 5 and 6 it is marked by the letter *d*. The width of the throat of chimney *d e* fig. 5, and *d i* fig. 6, is taken from the breast of the chimney to the back, and its length is taken at right angles to its width, or in a line parallel to the mantle *a* fig. 5 and 6.

"The bringing forward of the fire into the room, or rather bringing it nearer to the front of the opening of the fire-place, and the diminishing of the throat of the chimney, being two objects principally had in view in the alterations in fire-places here recommended, it is evident that both these may be attained merely by bringing forward the back of the chimney. The only question therefore is, how far it should be brought forward? The answer is short, and easy to be understood; bring it forward as far as possible, without diminishing too much the passage which must be left for the smoke. Now as this passage, which, in its narrowest part, I have called the throat of the chimney, ought, for reasons which are fully explained in the foregoing chapter, to be immediately, or perpendicularly over the fire, it is evident that the back of the chimney must always be built perfectly upright. To determine therefore the place for the new back, or how far precisely it ought to be brought forward, nothing more is necessary than to ascertain how wide the throat of the chimney ought to be left, or what space must be left between the top of the breast of the chimney, where the upright canal of the chimney begins, and the new back of the fire-place carried up perpendicularly to that height.

"In the course of my numerous experiments upon chimneys, I have taken much pains to determine the width proper to be given to this passage, and I have found, that, when the back of the fire-place is of a proper width, the best width for the throat of a chimney, when the chimney and the fire-place are of the usual form and size, is four inches. Three inches indeed might sometimes answer, especially where the fire-place is very small, and the chimney good, and well situated.

"It may perhaps appear extraordinary, upon the first view of the matter, that fire-places of such different sizes should all require the throat of the chimney to be of the same width; but when it is considered, that the capacity of the throat of a chimney does not depend on its width alone, but on its width and length taken together; and that in large fire-places, the width of the back, and consequently the length of the throat of the chimney, is greater than in those which are smaller, this difficulty vanishes.

"And this leads us to consider another important point respecting open fire-places, and that is, the width which it will in each case be proper to give to the back. In fire-places as they are now commonly constructed, the back is of equal width with the opening of the fire-place in front; but this construction is faulty on two accounts. First, in a fire-place so constructed, the sides of the fire-place, or covings, as they are called, are parallel to each other, and consequently ill-contrived to throw out into the room the heat they receive from the fire in the form of rays; and secondly, the large open corners which are formed by making the back as wide as the opening of the fire-place in front, occasion eddies of wind, which frequently disturb the fire, and embarrass the smoke in its ascent in such a manner as often to bring it into the room. Both these defects may be entirely remedied by diminishing the width of the back of the fire-place. The width which, in most cases, it will be best to give it, is one-third of the width of the opening of the fire-place in front. But it is not absolutely necessary to conform rigorously to this decision, nor will it always be possible. It will frequently happen that the back of a chimney must be made wider than, according to the rule here given, it ought to be. This may be, either to accommodate the fire-place to a stove, which being already on hand must, to avoid the expense of purchasing a new one, be employed; or for other reasons; and any small deviation from the general rule will be attended with no considerable inconvenience. It will always be best, however, to conform to it as far as circumstances will allow.

"Where a chimney is designed for warming a room of a middling size, and where the thickness of the wall of the chimney in front, measured from the front of the mantle to the breast of the chimney, is nine inches, I should set off four inches more for the width of the throat of the chimney, which supposing the back of the chimney to be built upright, as it always ought to be, will give thirteen inches for the depth of the fire-place, measured upon the hearth, from the opening of the fire-place in front to the back. In this case thirteen inches would be a good size for the width of the back; and three times thirteen inches, or thirty-nine inches, for the width of the opening of the fire-place in front; and the angle made by the back of the fire-place and the sides of it, or covings, would be just 135 degrees, which is the best position they can have for throwing heat into the room.

"But I will suppose that in altering such a chimney it is found necessary, in order to accommodate the fire-place to a grate or stove already on hand, to make the fire-place sixteen inches wide. In that case, I should merely increase the width of the back to the dimensions required, without altering the depth of the chimney, or increasing the width of the opening of the chimney in front. The covings, it is true, would be somewhat reduced in their width, by this alteration; and their position with respect to the plane of the back of the chimney would be a little changed; but these alterations would produce no bad effects of any considerable consequence, and would be much less likely to injure the fire-place, than an attempt to [illegible] the proportions of its parts nearer to the standard, by increasing the depth of the chimney, and the width of its opening in front: or than an attempt to preserve that particular obliquity of the covings which is recommended as the best (135 degrees), by increasing the width of the opening of the fire-place, without increasing its depth."

The provision made for the passage of the chimney-sweeper up the chimney is thus described: "In building up the new back of the fire-place, when this wall (which need never be more than the width of a single brick in thickness) is brought up so high that there remains no more than about ten or eleven inches between what is then the top of it, and the inside of the mantle, or lower extremity of the breast of the chimney, an opening, or door-way, eleven or twelve inches wide, must be begun in the middle of the back, and continued quite to the top of it, which, according to the height to which it will commonly be necessary to carry up the back, will make the opening about twelve or fourteen inches high: which will be quite sufficient to allow the chimney-sweeper to pass. When the fire-place is finished, this door-way is to be closed by a tile, or a fit piece of stone, placed in it, dry, or without mortar, and confined in its place by means of a rabbet made for that purpose in the brick work. As often as the chimney is swept, the chimney-sweeper takes down this tile, which is very easily done, and when he has finished his work he puts it again into its place. The drawing, fig. 6. will give a clear idea of this contrivance; and the experience I have had of it has proved that it answers perfectly well the purpose for which it is designed.

"I observed above, that the new back, which it will always be found necessary to build in order to bring the fire sufficiently forward, in altering a chimney constructed on the common principles, need never be thicker than the width of a common brick. I may say the same of the thickness necessary to be given to the new sides, or covings, of the chimney; or if the new back and covings are constructed of stone, one inch and three quarters, or two inches in thickness will be sufficient. Care should be taken, in building up these new walls, to unite the back to the covings in a solid manner.

"Whether the new back and covings are constructed of stone, or built of bricks, the space between them and the old back and covings of the chimney ought to be filled up, to give greater solidity to the structure. This may be done with loose rubbish, or pieces of broken bricks or stones, provided the work be strengthened by a few layers or courses of bricks laid in mortar; but it will be indispensably necessary to finish the work, where these new walls end, that is to say, at the top of the throat of the chimney, where it ends abruptly in the open canal of the chimney, by a horizontal course of bricks well secured with mortar. This course of bricks will be upon a level with the top of the door-way left for the chimney-sweeper.

"From these descriptions it is clear that where the throat of the chimney has an end, that is to say, where it enters into the lower part of the open canal of the chimney, there the three walls which form the two covings and the back of the fire-place all end abruptly. It is of much importance that they should end in this manner; for were they to be sloped outward, and raised in such a manner as to swell out the upper extremity of the throat of the chimney in the form of a trumpet, and increase it by degrees to the size of the canal of the chimney; this manner of uniting the lower extremity of the canal of the chimney with the throat would tend to assist the winds which may attempt to blow down the chimney, in forcing their way through the throat, and throwing the smoke backward into the room; but when the throat of the chimney ends abruptly, and the ends of the new walls form a flat horizontal surface, it will be much more difficult for any wind from above, to find and force its way through the narrow passage of the throat of the chimney.

"As the two walls which form the new covings of the chimneys are not parallel to each other, but inclined, presenting an oblique surface towards the front of the chimney; and as they are built perfectly upright and quite flat, from the hearth to the top of the throat; where they end, it is evident that an horizontal section of the throat will not be an oblong square; but its deviation from that form is a matter of no consequence; and no attempts should ever be made, by twisting the covings above, where they approach the breast of the chimney, to bring it to that form. All twists, bends, prominences, excavations, and other irregularities of form, in the covings of a chimney, never fail to produce eddies in the current of air which is continually passing into, and through an open fire-place in which a fire is burning; and all such eddies disturb either the fire, or the ascending current of smoke, or both; and not unfrequently cause the smoke to be thrown back into the room. Hence it appears, that the covings of chimneys should never be made circular, or in the form of any other curve; but always quite flat.

"For the same reason, that is to say, to prevent eddies, the breast of the chimney which forms that side of the throat that is in front, or nearest to the room, should be neatly cleaned off, and its surface made quite regular and smooth.

"This may easily be done by covering it with a coat of plaster, which may be made thicker or thinner in different parts as may be necessary, in order to bring the breast of the chimney to be of the proper form.

"With regard to the form of the breast of a chimney, this is a matter of very great importance, and which ought always to be particularly attended to.

"I have hitherto given no precise directions, in regard to the height to which the new back and covings ought to be carried. This will depend not only on the height of the mantle, but also, and more especially, on the height of the breast of the chimney, or of that part of the chimney where the breast ends and the upright canal begins. The back and covings must rise a few inches, five or six for instance, higher than this part, otherwise the throat of the chimney will not be properly formed; but I know of no advantages that would be gained by carrying them up still higher.

"In forming the door-way for the chimney-sweeper, the best method of proceeding is to place the tile or flat piece of stone destined for closing it, in its proper place; and to build round it, or rather by the sides of it: taking care not to bring any mortar near it, in order that it may be easily removed when the door-way is finished. With regard to the rabbet, which should be made in the door-way to receive it and fix it more firmly in its place, this may either be formed at the same time when the door-way is built, or it may be made after it is finished, by attaching to its bottom and sides, with strong mortar, pieces of thin roof tiles: such as are about half an inch in thickness will be the best for this use; if they are thicker, they will diminish too much the opening of the door-way, and will likewise be more liable to be torn away by the chimney-sweeper in passing up and down the chimney."

From the foregoing extracts, it is probable, sufficient information may be drawn, to enable the reader to judge accurately of the mode of constructing these improved fire-places. We shall nevertheless proceed to describe the different delineations in plate 70, from which the subject cannot fail of being clearly understood.

Fig. 1. shows the plan of a fire-place on the common construction. AB the opening of the fire-place in front. CD the back of the fire-place. AC and BD the covings

Fig. 2. shows the elevation, or front view of a fire-place on the common construction.

Fig. 3. shows how the fire-place represented by the fig. 1. is to be altered in order to its being improved. AB is the opening in front—CD the back, and AC and BD the covings of the fire-place in its original state. *ab* its opening in front—*ik* its back—and *ai* and *bk* its covings after it has been altered; *e* is a point upon the hearth, upon which a plumb suspended from the middle of the upper part of the breast of the chimney falls. The situation for the new back is ascertained by taking the line *cf* equal to four inches. The new back and covings are represented as being built of bricks; and the space between these and the old back and covings as being filled up with rubbish.

Fig. 4. represents the elevation or front view of the fire-place fig. 3. after it has been altered. The lower part of the door-way left for the chimney-sweeper is shown in this figure by dotted lines.

Fig. 5. shows the section of a chimney fire-place, and of a part of the canal of the chimney, on the common construction. *ab* is the opening in front; *bc* the depth of the fire-place at the hearth; *d* the breast of the chimney. *de* the throat of the chimney, and *df*, *gc*, a part of the open canal of the chimney.

Fig. 6. shows a section of the same chimney after it has been altered. *kl* is the new back of the fire-place; *li*, the tile or stone which closes the door-way for the chimney-sweeper; *di*, the throat of the chimney, narrow to four inches; *a*, the mantle, and *h*, the new wall made under the mantle to diminish the height of the opening of the fire-place in front. N.B. These two figures are sections of the same chimney which is represented in each of the four preceding figures.

Fig. 7. shows how the covings are to be placed, when the front of the covings (*a* and *b*) does not come so far forward as the front of the opening of the fire-place, or the jambs (A and B).

Fig. 8. shows how the width and obliquity of the covings are to be accommodated to the width of the back of a fire-place, in cases where it is necessary to make the back very wide.

Fig. 9. shows how an instrument called a bevel (*mn*), useful in laying out the work, in altering chimney fire-places, may be constructed.

Fig. 10. shows how, when the breast of a chimney (*d*) is too high, it may be brought down by means of a wall (*h*) placed under the mantle, and a coating of plaster, which in this figure is represented by the part marked with dots.

Fig. 11. shows how the breast of a chimney may be brought down merely by a coating of plaster.

Fire-pots, in the military art, small earthen pots, into which is put a charged grenade, and over that powder enough till the grenade is covered; then the pot is covered with a piece of parchment, and two pieces of match across lighted: this pot being thrown by a handle of match, where it is designed, it breaks and fires the powder, and burns all that is near it, and likewise fires the powder in the grenade, which ought to have no fuse, to the end its operations may be the quicker.

Fire, (Securing buildings against). The earl of Stanhope has discovered and published a very simple and effectual method for this purpose. He has divided it into three parts, viz. under-flooring, extra-lathing, and inter-securing. The method of under-flooring is either single or double. In single under-flooring, a common strong lath of oak or fir, about one-fourth of an inch thick, should be nailed against each side of every joist, and of every main timber, supporting the floor which is to be secured. Other similar laths are then to be nailed along the whole length of the joists, with their ends butting against each other. The top of each of these laths or fillets ought to be at one inch and a half below the top of the joists or timbers against which they are nailed; and they will thus form a sort of small ledge on each side of all the joists. These fillets are to be well bedded in a rough plaster hereafter mentioned, when they are nailed on, so that there may be no interval between them and the joists; and the same plaster ought to be spread with a trowel upon the tops of all the fillets, and along the sides of that part of the joists which is between the tops of the fillets and the upper edge of the joists. In order to fill up the intervals between the joists that support the floor, short pieces of common laths, whose length is equal to the width of these intervals, should be laid in the contrary direction to the joists, and close together in a row, so as to touch one another: their ends must rest upon the fillets, and they ought to be well bedded in the rough plaster, but are not to be fastened with nails. They must then be covered with one thick coat of the rough plaster, which is to be spread over them to the level of the tops of the joists: and in a day or two this plaster should be trowelled over close to the sides of the joists, without covering the tops of the joists with it.

In the method of double-flooring, the fillets and short pieces of laths are applied in the manner already described; but the coat of rough plaster ought to be little more than half as thick as that in the former method. Whilst this rough plaster is laid on, some more of the short pieces of laths above mentioned must be laid in the intervals between the joists upon the first coat, and be dipped deep in it. They should be laid as close as possible to each other, and in the same direction with the first layer of short laths. Over this second layer of short laths there must be spread another coat of rough plaster, which should be trowelled level with the tops of the joists without rising above them. The rough plaster may be made of coarse lime and hair; or, instead of hair, hay chopped to about three inches in length may be substituted with advantage. One measure of common rough sand, two measures of slacked lime, and three measures of chopped hay, will form in general a very good proportion, when sufficiently beat up together in the manner of common mortar. The hay should be put in after the two other ingredients are well beat up together with water. This plaster should be made stiff; and when the flooring boards are required to be laid down very soon, a fourth or fifth part of quicklime in powder, formed by dropping a small quantity of water on the limestone a little while before it is used, and well mixed with this rough plaster, will cause it to dry very fast. If any cracks appear in the rough plaster-work near the joists when it is thoroughly dry, they ought to be closed by washing them over with a brush wet with mortar-wash: this wash may be prepared by putting two measures of quicklime and one of common sand in a pail, and stirring the mixture with water till the water becomes of the consistence of a thin jelly.

Before the flooring boards are laid, a small quantity of very dry common sand should be strewed over the plaster-work, and struck smooth with an hollow rule, moved in the direction of the joists, so that it may lie rounding between each pair of the joists. The plaster-work and sand should be perfectly dry before the boards are laid, for fear of the dry rot. The method of under-flooring may be successfully applied to a wooden staircase; but no sand is to be laid upon the rough plasterwork. The method of extra-lathing may be applied to ceiling joists, to sloping roofs, and to wooden partitions.

The third method, which is that of inter-securing, is very similar to that of under-flooring; but no sand is afterwards to be laid upon it. Inter-securing is applicable to the same parts of a building as the method of extra-lathing, but it is seldom necessary.

The author of this invention made several experiments, in order to demonstrate the efficacy of these methods. In most houses it is only necessary to secure the floors; and the extra-expense of under-flooring, including all materials, is only about nine-pence per square yard, and with the use of quick-lime a little more. The extra-expense of extra-lathing is no more than six-pence per square yard for the timber side-walls and partitions; but for the ceiling about nine-pence per square yard. But in most houses no extra-lathing is necessary.

Fire-ship, in the navy, a vessel charged with artificial fire-works, which, having the wind of an enemy's ship, grapples her and sets her on fire.

Fi'reshovel. *s.* The instrument with which the hot coals are thrown up (*Brown*).

Fi'reside. *s.* The hearth; the chimney (*Prior*).

Fi'restick. *s.* A lighted stick or brand (*Digby*).

Fire-wood. *s.* Wood to burn; fuel.

Fire-works, are preparations made of gunpowder, sulphur, and other inflammable and combustible ingredients, used on occasion of public rejoicings and other solemnities. The invention of fire-works is by M. Mahudel attributed to the Florentines and people of Sienna; who found out likewise the method of adding decorations to them of statues, with fire issuing from their eyes and mouths. The art of preparing and managing these is called pyrotechny. See Pyrotechny.

FI'RER. *s.* An incendiary.

FI'RING. *s.* (from *fire*). Fuel (*Mort.*)

Firing in line, in the military art. According to regulations, the following principal heads constitute firing in line.

The object of fire against cavalry is to keep them at a distance, and to deter them from the attack: as their movements are rapid, a reserve is always kept up. But when the fire commences against infantry, it cannot be too heavy, or too quick while it lasts; and should be continued till the enemy is beaten or repulsed. This may not improperly be called offensive fire.

Defensive fire belongs principally to infantry, when posted on heights, which are to be defended by musquetry. As soldiers generally present too high, and as fire is of the greatest consequence to troops that are on the defensive, the habitual mode of firing should therefore be rather at a low level than a high one.

On these occasions the men are generally drawn up three deep; in which case the front rank kneeling, being the most efficacious as being the most raising, should not be dispensed with when it can be safely and usefully employed.

Firing by half-battalions, the line advancing. The left wings halt, and the right ones continue to march 15 paces, at which instant the word march being given to the left wings, the right at the same time are ordered to halt, fire, and load, during which the left march on and pass them, till the right wings being loaded and shouldered, receive the word march, on which the left ones halt, fire, &c. and thus they alternately proceed.

Firing by half-battalions, the line retiring. The right wings are ordered to halt, front, and when the left wings have gained fifteen paces, and have received the word halt, front, the right wings are instantly ordered to fire, load, face about, and march fifteen paces beyond the left ones, where they receive the word halt, front, on which the left wings fire, &c. and thus alternately proceed.

It is observed in the official rules and regulations, that in addition to the battalion directions, there must be a regulating battalion named, by the half-battalions of which each line will move, halt, and fire: the commander of each line will be with such half-battalion, and in giving his several commands must have an attention to the general readiness of the line, especially after loading, that the whole are prepared to step off together at the word march. The firing of the advanced wing succeeds the march, or the halt, front, of the retired wing instantly: and each half-battalion fires independent and quick, so that no unnecessary pauses being made betwixt the firing words, the fire of the line should be that of a volley as much as possible; and the whole being thereby loaded together, will be ready for the next command of movement. In these firings of the line advancing or retiring, the two first ranks will fire standing, and the rear rank support their arms.

In this manner also may the alternate battalions of a line advance or retire, and when the whole are to form, and that the last line moves up to the first, every previous help of advanced persons will be given to insure its correctness.

Fire in line advancing, is when the infantry marches in line to attack the enemy, and in advancing makes use of its fire. On these occasions it is better to fire the two first ranks only standing, reserving the third, than to make the front rank kneel and to fire the whole: but when it is necessary to fire at a considerable distance, or on a retiring enemy, volleys may be given by the three ranks, the front one kneeling.

Firing by platoons, is practised when a line is posted, or arrives at a fixed situation. In this position, battalions fire independently of one another, and the fire generally commences from the centre of each. The first fire of each battalion must be regular, and at established pauses and intervals; after which each platoon may continue to fire as soon as it is loaded, independent, and as quick as possible.

Firing by files, is generally used behind a parapet, hedge, or abbatis. In this situation the two first ranks only can fire, and that must be by the two men of the same file always firing together, with coolness and deliberation. When, however, the parapet, hedge, or abbatis, is but a little raised, platoon firing may be resorted to.

Oblique firing by battalions, or otherwise, according to the ground, is extremely advantageous when it is found expedient to give an oblique direction to part of a line, or when it is discovered that their fire can in this manner be thrown against the opening of a defile, the flanks of a column, or against cavalry or infantry that direct their attack on some particular battalion or portion of the line.

Oblique-firing, is either to the right and left, or from the right and left to the centre, depending entirely on the situation of the object to be fired against. The Prussians have a particular contrivance for this purpose: if they are to level to the right, the rear ranks of every platoon are to make two quick but small paces to the left, and the body of each soldier to turn 1-8th of a circle; and are to take the same distance to the right, if they are to level to the left.

When a line halts at its point of firing, no time is to be lost in scrupulous dressing, and the firing is instantly to commence. But when a line halts, and is not to fire, the usual dressings must be attended to; and every thing will depend upon the coolness and attention of the officers and non-commissioned officers.

It should be observed with respect to firings in general, that after the march in front, and halt of the battalion, company, or platoon, firing ought invariably to begin from the centre, and not from the flank. In other cases, and in successive formations, it may begin from whatever division first arrives and halts on its own ground.

Square firing, is that method of firing where either a regiment or any body of men are drawn up in a square, each front of which is generally divided into four divisions or firings, and the flanks of the square, as being the weakest part, are sometimes covered by four platoons of grenadiers who flank the angles. The first fire is from the right division of each face, the second fire from the left division of each face, and so on; the grenadiers making the last fire.

Street-firing, is the method of firing adopted to defend or scour a street, lane, or narrow pass of any kind; in the execution of which the platoon must be formed according to the width of the place, leaving sufficient room on the flanks for the platoons which have fired successively to file round to the rear of the others.

Firing, in the veterinary art, the application of the firing iron, red hot, to some preternatural swelling, &c. of the horse, in order to discuss it. This is oftentimes done by clapping the firing iron to the skin, without piercing it.

The firing instrument or knife ought to be somewhat rounded on the edge, and gradually thicker to the back, sufficient to keep the heat of the fire for some time. It should be rubbed clean, that no dirt or ashes may stick to it; and not used until the flaming redness is in part gone off.

On the utility of this operation, Mr. John Lawrence expresses himself with modesty as follows: "I must acknowledge that I am by no means prepared to give a decided opinion on the subject of firing, or the application of the actual cautery, in strains: the truth is, I have had few horses fired, and with those few it did not succeed. Its use is said to be, to discuss swellings by promoting absorption, and in contracting the skin to form a constant bandage round the sinews, both during the cure and ever afterwards. What strikes me as the most important benefit in the measure is, the support it is apt to give to the parts after the cure. The necessary precautions respecting the operation upon the back sinews are, that the parts to be fired be not in a state of inflammation, that no cross lines be made on any account, that the fire be only given deep enough to have sufficient effect upon the skin, without burning the sheaths of the tendons; that no person be suffered to mount the horse, but that he be turned to grass, as soon as convenient, for at least three months. The windgalls, I think, should be let out previous to firing. When the operation is intended to be very effectual, the lines are drawn thick around the leg, from the bottom of the pasterns almost up to the knee. I should conceive that fewer lines would make a firmer bandage, I must remark also, that a man's common sense must naturally depict the operation of cauterizing as a very delicate one, and by no means within the power of every heavy-handed smith.

"When the pastern joints are exceedingly full and swelled, the legs gorged, the tendons enlarged, in fact the parts indurated, there seems an almost absolute necessity for blistering and firing, since no other measures will be sufficiently discutient."

The author apprehends, with respect to race-horses, that there are few but "must be shortened in their speed, if fired to any effectual purpose;" and that, after all, it is a chance "but that a force sufficient again to start the tendon must also be adequate to loosen or burst the bandage."

It is the practice at the veterinary college, in firing, to draw the lines vertically round the affected limb; the contraction of the skin in that direction forming the most effectual and uniform bandage on the part.

The use of firing, with respect to spavins, ringbones, &c. is treated of in their proper places. See the articles SPAVIN, &c.

FIRING is also a term used by horse-dealers to express a certain cracking or discipline of the whip, by which a dull or stiffened horse is made to frisk about and appear spirited for the purpose of sale. It is so denominated because from the severity with which this cruel discipline is sometimes applied, the flanks of the horse, or some other part, appear almost as striped and mangled as if fired with hot iron.

FIRING-IRON, the instrument with which the operation of firing is performed in the veterinary art. It is a piece of iron about fifteen inches long, with a stem terminating in a wooden handle at one end, having a blade of three inches long, and two wide at the other. This blade is forged flat, and is at the back half an inch in thickness, becoming gradually thinner by a third part towards the edge. It is formed of different dimensions for different occasions, and three or four are introduced into the fire at the same time, and employed successively.

To **FIRK.** *v. a.* (from *ferio*, Latin.) To whip; to beat; to correct; to chastise (*Hudibras*).

FI'RKIN. *s.* (from ꝼeoƿeꞃ, Saxon.) 1. A vessel containing nine gallons (*Arbuthnot*). 2. A small vessel (*Denham*).

FIRKIN, an English measure of capacity, for things liquid, being the fourth part of the barrel: it contains nine gallons of beer.

FIRLOT, a dry measure used in Scotland. The oat-firlot contains 21¼ pints of that country; the wheat-firlot contains about 2,211 cubical inches; and the barley-firlot, 31 standard pints. Hence it appears that the Scotch wheat-firlot exceeds the English bushel by 33 cubical inches.

FIRM. *s.* (*firmus*, Latin.) 1. Strong; not easily pierced or shaken; hard, opposed to soft (*Cleaveland*). 2. Constant; steady; resolute; fixed; unshaken (*Tillotson. Walsh*). 3. Solid; not giving way; not fluid (*Ral.*).

To **FIRM.** *v. a.* (*firmo*, Latin.) 1. To settle; to confirm; to establish; to fix (*Knolles*). 2. To fix without wandering (*Spenser*).

FIRM, in commercial nomenclature, is a term used to express the names of the principal persons engaged in any mercantile concern. Thus we speak of the brewing business conducted under the firm of "Barclay, Perkins, and Co.;" the banking business under the firm of "Ladbrokes, Watson, and Gillman;" the clothiers' business under the firm of "Beddome, Fysh, and Co."

FIRMAMENT, in the old astronomy, is the orb of the fixed stars, or the highest of all the heavens. But in scripture and common language it is used for the middle regions, or the space or expanse appearing like an arch quite round or above us in the heavens. Many ancients and moderns also accounted the firmament a fluid matter; but those who gave it the name of firmament must have taken it for a solid one.

FIRMAMENT, in various places of scripture, is used for the middle region of the air.

FIRMAME'NTAL. *a.* (from *firmament.*) Celestial; of the upper regions (*Dryden*).

FIRMIN (Thomas), an English gentleman, celebrated for his good works. He was born at Ipswich, in Suffolk, in 1632, and was apprenticed to a tradesman in London. On being out of his time, he began business for himself in the linen manufacture in which he had good success. His benevolence was so famous, that some of the greatest divines of the age were glad of his friendship, particularly Dr. Tillotson. He erected a warehouse for the employment of the poor in the linen manufacture; and when the French protestants came over he set up another for their use at Ipswich. For the last twenty years of his life, he was one of the governors of Christ's hospital, to which he was a liberal benefactor. There was hardly, indeed, any public charity in which he had not some concern. This truly good man died in 1697, and was buried in the cloisters of Christ's hospital. Memoirs of his life have been published by Mr. Cornish.

FI'RMLY. *ad.* (from *firm.*) 1. Strongly; impenetrably; immoveably. 2. Steadily; constantly (*Addison*).

FI'RMNESS. *s.* (from *firm.*) 1. Hardness; compactness; solidity (*Burnet*). 2. Durability; stability (*Hayward*). 3. Certainty; soundness (*South*). 4. Steadiness; constancy; resolution (*Roscommon*).

FIRST. *s.* (ꝼıꞃꞅꞇ, Saxon.) 1. The ordinal of one (*Shakspeare*). 2. Earliest in time (*Prior*). 3 Foremost in place. 4. Highest in dignity (*Daniel*). 5. Great; excellent (*Shak.*).

FIRST. *ad.* 1. Before any thing else; earliest (*Dryden*). 2. Before any other consideration (*Bacon*). 3. *At* FIRST. At the beginning (*Bentley*). 4. FIRST *or last.* At one time or other (*Dryden*).

FIRST, in music, is applied to the upper part in a duet, trio, &c. In the score it is customary to place the first immediately above the second, the second in the stave above the third, and so on.

FIRST-BEGOT. FIRST-BEGOTTEN. *s.* (from *first* and *begot.*) The eldest of children (*Milton*).

FIRST-BORN. *s.* Eldest; the first by the order of nativity (*Locke*).

FIRST-FRUITS. *s.* (*first* and *fruits.*) 1. What the season earliest produces or matures of any kind (*Prior*). 2. The first profits of any thing (*Bacon*). 3. The earliest effect of any thing (*Milton*).

FI'RSTLING. *a.* (from *first.*) That is first produced or brought forth (*Deuteronomy*).

FI'RSTLING. *s.* (from *first.*) 1. The first produce or offspring (*Milton*). 2. The thing first thought or done (*Shakspeare*).

FISC, in the civil law, the treasury of a prince. It differs from the ærarium, which was the treasury of the public or people; thus, when the money arising from the sale of condemned persons' goods was appropriated for the use of the public, their goods were said *publicari*; but when it was destined for the support of the prince they were called *confiscari*.

FISCAL, in the civil law, something relating to the pecuniary interest of the prince or people. The officers appointed for the management of the fisc were called *procuratores fisci*, and *advocati fisci*; and among the cases enumerated in the constitutions of the empire, where it was their business to plead, one is against those who have been condemned to pay a fine to the fisc on account of their litigiousness, or frivolous appeals.

FISCUS. See Fisc.

FISH. *s.* (ꝼiꞅc, Saxon.) 1. An animal that inhabits the water. *Fish* is used collectively for the race of *fishes* (*Shakspeare*). 2. The flesh of fish, opposed to that of terrestrial animals, called flesh (*Brown*).

To **Fish.** *v. n.* 1. To be employed in catching fishes. 2. To endeavour at any thing by artifice (*Shakspeare*).

To **Fish.** *v. a.* To search water in quest of fish, or any thing else (*Swift*).

Fish, in a ship, a plank or piece of timber, fastened to a ship's mast or yard, to strengthen it; which is done by nailing it on with iron spikes, and winding ropes hard about them.

Fish-glue. See Ichthyocalla.

Fish (Gold). See Cyprinus.

Fish-pond, a small pool for the breeding and feeding of fish.

Fish river (Great), a considerable river of Africa, which rises in the unknown interior regions, divides Caffraria from the country of the Hottentots, and falls into the Indian ocean, in Lat. 30. 30 S. The deepest parts of this river are inhabited by the hippopotamus, and the adjacent woods by elephants, rhinoceroses, and buffaloes.

FI'SHER. *s.* (from *fish*.) One who is employed in catching fish.

Fisher (John), an English prelate. He was born at Beverly, in Yorkshire, in 1459, and educated at Cambridge. On entering into orders he became confessor to Margaret countess of Richmond, mother of Henry VII. who by his advice founded St. John's and Christ's colleges, Cambridge. He was afterwards chosen chancellor of that university, and was a liberal encourager of learning. In 1504 he was made bishop of Rochester, from which he would never remove to a better see. He was a zealous opponent of the reformation; and when the business of the king's divorce was agitated, Fisher spoke with great freedom in behalf of the queen, as he also did for the pope's supremacy. Every effort was made to bring him over to an approbation of the king's proceedings, but all these proving ineffectual he was sent to the Tower, and attainted of high treason. While he lay in confinement the pope made him a cardinal, which so provoked Henry, that he prohibited the hat from being brought into his dominions, and sent Cromwell to the bishop to sound whether he intended accepting it. His answer being in the affirmative, the king exclaimed, "Yea, is he so lusty? Well, let the pope send him a hat when he will, mother of God, he shall wear it on the shoulders then; for I will leave him never a head to set it on." The tyrant was as good as his word, for the bishop was brought to his trial, condemned, and beheaded, in 1535. Erasmus says, that he was a man of integrity, deep learning, sweetness of temper, and greatness of soul. He wrote several books, some against Luther, and others of a practical nature.

FI'SHERBOAT. *s.* (*fisher* and *boat*.) A boat employed in catching fish.

FI'SHERMAN. *s.* One whose employment and livelihood is to catch fish (*Waller*).

FI'SHERTOWN. *s.* A town inhabited by fishermen (*Clarendon*).

FISHERY, a place where great numbers of fish are caught.

The principal fisheries for salmon, herring, mackrel, pilchards, &c. are along the coasts of England, Scotland, and Ireland; for cod, on the banks of Newfoundland; for whales, about Greenland; and for pearls, in the East and West Indies.

Fishery (Free), in law, or an exclusive right of fishing in a public river, is a royal franchise; and is considered as such in all countries where the feudal polity has prevailed: though the making such grants, and by that means appropriating, what it seems unnatural to restrain, the use of running water, was prohibited for the future by Magna Charta; and the rivers that were fenced in king John's time were directed to be laid open, as well as the forests to be disforested.

Fishery, denotes also the commerce of fish, more particularly the catching them for sale. Were we to enter into a very minute consideration of the fisheries established in this kingdom, this article would swell beyond its proper bounds; however, since fisheries, if successful, are not only objects of great commercial importance, but also contribute materially to our naval strength, by becoming permanent nurseries for seamen, we shall take notice of some of the most considerable of the British fisheries, and the institutions set on foot for their support.

The situation of the British coasts is the most advantageous in the world for catching fish: the Scottish islands, particularly those to the north and west, lie most commodious for carrying on the fishing trade to perfection; for no country in Europe can pretend to come up to Scotland in the abundance of the finest fish, with which its various creeks, bays, rivers, lakes, and coasts are replenished. Of these advantages, the Scots seem indeed to have been abundantly sensible; for their traffic in herrings is even noticed in history so early as the ninth century. The frequent laws which were enacted in the reigns of James III. IV. and V. discover a steady determined zeal for the benefit of the country, and the full restoration of these fisheries, which the Dutch had found means to engross.

Anchovy-Fishery.—The anchovy is caught in the months of May, June, and July, on the coasts of Catalonia, Provence, &c. at which season it constantly repairs up the straits of Gibraltar into the Mediterranean. Collins says they are also found in plenty on the western coasts of England and Wales.

The fishing for them is chiefly in the night-time, when a light being put on the stern of their little fishing-vessels, the anchovies flock round, and are caught in the nets. But then it is asserted to have been found by experience, that anchovies taken thus by fire are neither so good, so firm, nor so proper for keeping, as those which are taken without fire.

When the fishery is over, they cut off the heads, take out their gall and guts, and then lay them in barrels, and salt them. The common way of eating anchovies is with oil, vinegar, &c. in order to which they are first boned, and the tails, fins, &c. slipped off. Being put on the fire, they dissolve almost in any liquor. Or they are made into sauce by mincing them with pepper, &c. Some also pickle anchovies in small delft or earthen pots, made on purpose, of two or three pounds weight, more or less, which they cover with plaster to keep them the better. Anchovies should be chosen small, fresh pickled, white on the outside and red within. If genuine, they have round backs; for those which are flat or large are often nothing but sardines. See CLUPEA.

Cod-Fishery.—There are two kinds of cod-fish; the one green or white cod, and the other dried or cured cod; though it is all the same fish, differently prepared; the former being sometimes salted and barrelled, then taken out for use; and the latter having lain for a competent time in salt, and then dried in the sun or smoke.

The chief fisheries for *green* cod are in the bay of Canada, on the great bank of Newfoundland, and on the isle of St. Peter, and the isle of Sable; to which places vessels resort from many parts both of Europe and America. They are from 100 to 150 tons burden, and will catch between 30,000 and 40,000 cod each. The most essential part of the fishery is, to have a master who knows how to cut up the cod, one who is skilled to take off the head properly, and, above all, a good salter, on which the preserving of them, and consequently the success of the voyage, depends. The best season is from the beginning of February to the end of April; the fish, which in the winter retire to the deepest water, coming then on the banks, and fattening extremely. What are caught from March to June keep well; but those taken in July, August, and September, when it is warm on the banks, are apt to spoil soon. Each fisher takes but one at a time, yet the most expert will take from 350 to 400 in a day; but that is the most, the weight of the fish and the great coldness on the bank fatiguing very much. As soon as the cod are caught, the heads are taken off; they are opened, gutted, and salted: and the salter stows them in the bottom of the hold, head to tail, in beds a fathom or two square; putting layers of salt and fish alternately, but never mixing fish caught on different days. When they have lain thus three or four days to drain off the water, they are placed in another part of the ship, and salted again; where they remain till the vessel is loaded. Sometimes they are cut in thick pieces, and put in barrels for the greater convenience of carriage.

The principal fishery for dry cod is, from Cape Rose to the Bay des Exports, along the coast of Placentia, in which compass there are several commodious ports for the fish to be dried in. These, though of the same kind with the fresh cod, are much smaller, and therefore fitter to keep, as the salt penetrates more easily into them. The fishery of both is much alike; only this latter is most expensive, as it takes up more time, and employs more hands, and yet scarce half so much salt is spent in this as in the other. The bait is herring, of which great quantities are taken on the coast of Placentia. When several vessels meet, and intend to fish in the same port, he whose shallop first touches ground becomes entitled to the quality and privileges of admiral: he has the choice of his station, and the refusal of all the wood on the coast at his arrival. As fast as the masters arrive, they unrig all their vessels, leaving nothing but the shrouds to sustain the masts; and in the mean time the mates provide a tent on shore, covered with branches of trees, and sails over them, with a scaffold of great trunks of pines, 12, 15, 16, and often 20 feet high, commonly from 40 to 60 feet, and about one-third as much in breadth. While the scaffold is preparing, the crew are a-fishing; and as fast as they catch, they bring their fish ashore, and open and salt them upon moveable benches; but the main salting is performed on the scaffold. When the fish have taken salt, they wash and hang them to drain on rails; when drained they are laid on a sort of stages, which are small pieces of wood laid across, and covered with branches of trees, having the leaves stripped off for the passage of the air. On these stages they are disposed of a fish thick, head against tail, with the back uppermost, and are turned carefully four times every twenty-four hours. When they begin to dry, they are laid in heaps ten or twelve thick, in order to retain their warmth; and every day the heaps are enlarged, till they become double their first bulk; then two heaps are joined together, which they turn every day as before: lastly, they are salted again, beginning with those first salted; and being laid in huge piles, they remain in that situation till they are carried on board the ships, where they are laid on the branches of trees disposed for that purpose, upon the ballast, and round the ship, with mats to prevent their contracting any moisture.

The cod supplies four kinds of commodities, viz. the zounds, the tongues, the roes, and the oil, which is extracted from its liver. The first is salted at the fishery, together with the fish, and put in barrels of from 600 to 700 pounds. The tongues are cured in like manner, and brought in barrels of from 400 to 500 pounds. The roes are also salted in barrels, and serve to cast into the sea to draw fish together, and particularly pilchards. The oil comes in barrels of from 400 to 520 pounds, and is used in dressing leather. See GADUS.

Coral-Fishery. See CORAL.

Herring-Fishery. The herring is a small salt-water fish, with a bluish back and a white silvered belly, not unlike a little shad-fish; whence it is called in Latin *alosa minor.* Rondeletius calls it *harengus.*

They usually make two fishing seasons for herrings; the first in June, July, and August; the second in autumn; the latter of these is the more considerable, on account of the fogs, which are very favourable to this kind of fishing.

About the beginning of June, a shoal of herrings, exceeding in bulk not less than the whole extent of Great Britain and Ireland, comes from the North, on the surface of the sea; and their approach is known to the Shetlanders by several tokens in the air and water. It is not certainly known from whence they come; though it is probable that their winter rendezvous is within the arctic circle, where the seas swarm with insect food in greater abundance than in our warmer latitudes. But when they arrive in these seas, they cast their spawn; for they come to us full, and are shotten long before they leave us. As the great shoal formed by the migrating herrings, and divided into distinct columns, five or six miles in length, and three or four in breadth, reflecting in bright weather many splendid colours, passes between the shores of Greenland and the North Cape, it is probably much straitened, and as it reaches the extremities of Great Britain, it is separated into two parts; one part steers west or south-west, and, leaving the islands of Orkney and Shetland to the left, passes on towards Ireland; where, being interrupted by that island, this part is again divided; some, keeping to the coast of Britain, go southward down St. George's or the Irish channel, and the others edging off for want of room to the west and south-west, go along the Hibernian ocean, and, keeping on the coast, reach the south shore of Ireland, from whence they steer southward, and join the rest in the Irish channel. The other part of the first division made in the north, parting a little to the east and south-east, come down into the German ocean: they pass by Shetland, and make the point of Buchaness, and the coast of Aberdeen, filling the bays, friths, rivers, and creeks, with their innumerable multitudes. Hence they proceed southward, pass by Dunbar, and rounding the high shores of St. Tobbs and Berwick, are seen again off Scarborough, and not before; but not in bulk, till they come to Yarmouth roads in England, and thence to the mouth of the Thames; from whence passing the British channel, they are seen no more in any number. The herrings are found again upon the shores of North America, though not in such quantities as with us; and they are seen no farther south than the rivers of Carolina. Whether these may be part of that large shoal, which, at their first coming by the coast of Greenland, keep to the coasts of America on the north-west side, or whether they are the remainder of those that pass our channels, is uncertain; but we know that they are not seen in quantities in any of the southern kingdoms, as Spain, Portugal, or the south parts of France, on the side of the ocean, or in the Mediterranean, or on the coast of Africa.

The following account of the *herring* fishery, as carried on by the Lowestoft merchants, is taken from Gillingwater's History of Lowestoft, p. 94, &c. "The herring season begins on the eastern coast of England, about a fortnight before Michaelmas, and continues till Martinmas. The number of boats annually employed at Lowestoft in this fishery, upon an average, from 1772 to 1781, was about 35; and the quantity of herrings caught in each of these years was about 714 lasts (of 10,000 herrings each), or 21 lasts to a boat, which makes the quantity of herrings caught by the Lowestoft boats during that period to be 7140 lasts. These herrings were sold, upon an average, at 12*l.* 10*s.* per last, which makes the whole produce arising from the sale of the said fish to be 89,250*l.* After the year 1781, the number of boats employed in this fishery was rather less, occasioned by the war with the Dutch and other powers.

"At the beginning of the season the boats sail off to sea about 13 leagues N. E. from Lowestoft, in order to meet the shoals, or second part of the first division of herrings (mentioned above), which separated off the north part of Scotland. Being arrived on the fishing ground, in the evening (the proper time for fishing) they shoot out their nets, extending about 2200 yards in length and 8 in depth, which by the help of small casks, called bowls, fastened on one side at the distance of 44 yards from each other, cause the nets to swim in a position perpendicular to the surface of the water. If the quantity of fish caught in one night amounts only to a few thousands, they are salted, and the vessels, if they have no better success, continue on the fishing ground two or three nights longer, salting the fish as they are caught, till they have obtained a considerable quantity, when they bring them into the roads, where they are landed and lodged in the fish-houses. Sometimes, when the quantity of fish is very small, they will continue on the fishing ground a week or ten days; but in general they bring in the fish every two or three days, and sometimes oftener, especially when the quantity amounts to 6 or 7 lasts, which frequently happens, and instances have been known where a single boat has brought into the roads at one time 12 or 14 lasts.

"As soon as the herrings are brought on shore, they are carried to the fish-houses, where they are salted, and laid on the floors in heaps about two feet deep; after they have continued in this situation about fifty hours, the salt is washed from them by putting them in baskets, and plunging them into water, from whence they are carried to an adjoining fish-house, where, after being pierced through the gills by small wooden spits about 4 feet long, they are handed to the men in the upper part of the house, who place them at proper distances as high as the top of the roof, where they are cured or made red.

"The upper part of the house being thus filled with herrings, many small wood fires are kindled underneath, upon the floor, whose number is in proportion to the size of the room, and the smoke which ascends from these fires is what dries or cures the herrings. After the fish have hung in this manner about 7 days, the fires are extinguished, that the oil and fat may drip from them, and in about two days after the fires are rekindled, and after two or more such drippings, the fires are kept continually burning until the herrings are perfectly cured, which requires a longer or a shorter time, according as they are designed either for foreign or home consumption.

"After the herrings have hung a proper time, they are taken down (which they call striking), and are packed in barrels, containing 800 or 1000 each, and then shipped off for market." See CLUPEA.

Lobster-Fishery.—Lobsters are taken along the British channel, and on the coast of Norway, whence they are brought to London for sale; and also in the frith of Edinburgh, and on the coast of Northumberland. See the article CANCER. By 10 and 11 W. III. cap. 24. no lobster is to be taken under eight inches in length, from the peak of the nose to the end of the middle fin of the tail; and by 9 Geo. II. cap. 33. no lobsters are to be taken on the coast of Scotland from the first of June to the first of September. See CANCER..

Mackrel-Fishery.—The mackrel is a summer fish of passage, found in large shoals, in different parts of the ocean, not far north; but especially on the French and English coasts. The fishing is usually in the months of April, May, and June, and even July, according to the place. See SCOMBER.

They enter the English channel in April, and proceed up to the straits of Dover as the summer advances; so that by June they are on the coasts of Cornwall, Sussex, Normandy, Picardy, &c. where the fishery is most considerable. They are an excellent food fresh; and not to be despised, when well prepared, pickled, and put up in barrels; a method of preserving them chiefly used in Cornwall. The fish is taken in two ways; either with a line or nets: the latter is the more considerable, and is usually performed in the night-time. See SCOMBER.

Oyster-Fishery.—This fishery is principally carried on at Colchester in Essex; Feversham and Milton in Kent; the Isle of Wight; the Swales of the Medway; and Tenby on the coast of Wales. From Feversham, and adjacent parts, the Dutch have sometimes loaded a hundred large hoys with oysters in a year. They are also taken in great quantities near Portsmouth, and in all the creeks and rivers between Southampton and Chichester; many of which are carried about by sea to London and to Colchester, to be fed in the pits about Wavenhoe and other places. See OSTREA.

Fishery (Pearl). See PEARL FISHERY.

Pilchard-Fishery. The pilchard is a small salt-water fish, bigger than the anchovy, but less than the herring, which in other respects it resembles. Its head is yellow; its belly white; and its back a sea-green. It eats admirably, fresh, or lightly salted.

There are certain seasons for fishing the pilchard; which, like the herring and anchovy, is a fish of passage; and its arrival is indicated by similar signs with that of the herrings. They are prepared and salted much as the anchovy is; with this difference, that the head is cut off the latter; but the pilchard were distinguishable from the anchovy, even though its head were off likewise; the pilchard having a very flat back, and the anchovy a round one.

The chief pilchard fisheries are along the coasts of Dalmatia, to the south of the island Issea; on the coasts of Bretagne, from Belle island as far as Brest; and along the coasts of Cornwall and Devonshire.

It is a saying of the Cornish men, with regard to the pilchard, that it is the least fish in size, most in number, and greatest in gain, of any they take out of the sea. This observation is amply confirmed by Dr. Borlase's account of this fishery; for besides the great number of persons employed by it, the poor are fed with the offals of the captures, the land with the refuse of the fish and salt, the merchant finds the gains of commission and commerce, and the fisherman the gains of the fish. The usual produce of the number of hogsheads exported each year, for ten years, from 1747 to 1756, inclusive, from the four ports of Fowey, Falmouth, Penzance, and St. Ives, amounted to 29,795 hogsheads. Every hogshead for ten years last past, together with the bounty allowed for each hogshead exported, and the oil made out of each, has amounted, one year with another, at an average, to the price of 1l. 13s. 3d.; so that the cash paid for pilchards exported has, at a medium, annually amounted to the sum of 49,532l. 10s. See CLUPEA.

Salmon-Fishery. For a description of this fish, see the article SALMO. The chief salmon fisheries in Europe are in England, Scotland, and Ireland, in the rivers, and sea-coasts adjoining to the river mouths. The most distinguished for salmon in Scotland are, the river Tweed, the Clyde, the Tay, the Dee, the Don, the Spey, the Ness, the Bewly, &c. in most of which it is very common, about the height of summer, especially if the weather happens to be very hot, to catch four or five score salmon at a draught. The chief rivers in England for salmon are, the Tyne, the Trent, the Severn, and the Thames. The fishing is performed with nets, and sometimes with a kind of locks or weirs made on purpose, which in certain places have iron or wooden grates so disposed, in an angle, that being impelled by any force in a contrary direction to the course of the river, they may give way and open a little at the point of contact, and immediately shut again, closing the angle. The salmon, therefore, coming up into the rivers, are admitted into these grates, which open, and suffer them to pass through, but shut again, and prevent their return. The salmon is also caught with a spear, which they dart into him when they see him swimming near the surface of the water. It is customary likewise to catch them with a candle and lanthorn, or whisp of straw set on fire; for the fish naturally following the light, are struck with the spear, or taken in a net spread for that purpose, and lifted with a sudden jerk from the bottom.

"The capture of salmon in the Tweed, about the month of July (says Mr. Pennant) is prodigious. In a good fishery, often a boat-load, and sometimes near two, are taken in a tide: some few years ago there were above 700 fish taken at one haul, but from 50 to 100 is very frequent. The coopers in Berwick then begin to salt the salmon thoroughly in pipes and other large vessels, and afterwards barrel them to send abroad, having then far more than the London markets can take off their hands." See SALMO.

Sturgeon-Fishery. The greatest sturgeon-fishery is in the mouth of the Volga, on the Caspian sea; where the Muscovites employ a great number of hands, and catch them in a kind of inclosure formed by huge stakes representing the letter Z repeated several times. These fisheries are open on the side next the sea, and close on the other; by which means the fish ascending in its season up the river is embarrassed in these narrow angular retreats, and so easily killed with a harping-iron. Sturgeons, when fresh, eat deliciously; and in order to make them keep, they are salted or pickled in large pieces, and put up in cags from 30 to 50 pounds. But the great object of this fishery is the roe, of which the Muscovites are extremely fond; and of which is made the cavear, or kavia, so much esteemed by the Italians. See CAVEAR and ACCIPENSER.

Whale-fishery.—These immense fish are chiefly caught in the North sea. The largest sort are found about Spitzbergen, some of them being there two hundred feet in length. Those on the coasts of America are about ninety or a hundred; and those on the coasts of Guyenne, and the Mediterranean, are the smallest of all.

The legislature, justly considering this trade as of great national importance, bestowed upon it at different periods very considerable encouragements. In particular, every British vessel of 200 tons or upwards, bound to the Greenland seas on the whale-fishery, if found to be duly qualified according to the act, obtained a licence from the commissioners of the customs to proceed on such voyage: and on the ship's return, the master and mate, making oath that they proceeded on such voyage and no other, and used all their endeavours to take whales, &c. and that all the whale-fins, blubber, oil, &c. imported in their ship, were taken by their crew in those seas, there was allowed 40s. for every ton according to the admeasurement of the ship.

It was afterwards found, however, that so great a bounty was neither necessary to the success of the trade, nor expedient with regard to the public. In 1786, therefore, the acts conferring the said emoluments being upon the point of expiring, the subject was brought under the consideration of parliament; and it was proposed to continue the former measures, but with a reduction of the bounty from 40s. to 30s. In proposing this alteration, it was stated, "that the sums which this country had paid in bounties for the Greenland fishery amounted to 1,265,461l.; that in the last year we had paid 94,858l.; and that, from the consequent deduction of the price of the fish, the public at present paid 60 per cent. upon every cargo. In the Greenland fishery there were employed 6000 seamen, and these seamen cost government 13l. 10s. per man per annum, though we were never able to obtain more than 500 of that number to serve on board our ships of war. Besides, the vast encouragement given to the trade had occasioned such a glut in the market, that it was found necessary to export considerable quantities; and thus we paid a large share of the purchase money for foreign nations, as well as for our own people, besides supplying them with the materials of several important manufactures." This proposition was opposed by several members, but was finally carried; and the propriety of the measure became very soon apparent. At that time (1786) the number of ships employed from England in the whale-fishery to Davis's Straits and the Greenland seas amounted to 139, besides 15 from Scotland. The proposed alteration took place the next year (1787); and notwithstanding the diminution of the bounty, the trade increased, the number of ships employed the same year from England amounting to 217, and the next year (1788) to 222.

To give some idea of the manner and importance of this trade, we shall here subjoin the discipline for a long time observed in the whale-fishery; the method of fishing; the cargo and equipage of a vessel; and the produce thereof.

The discipline is adjusted by a standing regulation, consisting of twelve articles; the principal whereof are:

That in case a fishing-vessel be shipwrecked, and the captain and crew saved, the next vessel they meet shall take them in; and the second vessel take half of them from the first; but that no vessel shall be obliged to take any of the loading of a vessel shipwrecked; that the effects of a shipwrecked vessel, which are absolutely relinquished, and which another captain shall find, and take up, upon his arrival in Holland, he shall account for one half of them to the proprietors of the shipwrecked vessel, clear of all expenses; that, if the crew desert a shipwrecked vessel, they shall have no claim to any of the effects saved, but the whole shall go to the proprietor; but if they be present when the effects are saved, and assist therein, they shall have one-fourth thereof; that if a person kill a fish on the ice, it shall be reputed his own, so long as he leaves any person with it; but the minute he leaves it, it becomes the due of the first captain that comes that way; but that, if a fish be tied to an anchor, or a rope fastened to the shore, it shall remain to its first proprietor, though he leaves it alone; that if any person be wounded or lamed in the service, the commissioners of the fishery undertake to procure him a reasonable satisfaction; to which the whole fleet shall contribute.

Besides this general regulation, to the observance of which all the captains, pilots, and masters of vessels, are obliged to swear, before they put to sea, there is also a particular one for each ship's crew, which they are all sworn to execute, in presence of one of the commissioners, who goes aboard every ship, to receive the oath.

This regulation is a kind of charter-party, importing, that they will attend prayers morning and evening, on pain of an amercement, at the discretion of the captain; that they will not get drunk, nor draw their knives, on forfeiture of half of their wages; nor fight, on forfeiture of the whole; that no one shall lay wagers on the good or ill success of the fishing, nor buy or sell, on these conditions, in case we take one or more fish, on penalty of twenty-five florins; that they will be contented with the provisions allowed them; and that they will never light fire, candle, or match, by night or day, without the captain's leave, on the like penalty.

After the reading of this regulation, the crew are all called, to receive the customary gratuity before their setting out, with an assurance of another sum at their return, in proportion to the success of the fishing.

The captain, on this occasion, receives from a hundred to a hundred and fifty florins; the pilot from forty to sixty; each harpooner from forty to fifty florins; the other officers from twenty-six to thirty-six florins; the elder sailors twenty; and the younger twelve.

The fleet, which consists mostly of fluyts, from two to three hundred tons, and from thirty-six men to forty-two, usually sets sail about the beginning of April, and takes its course by the isles of Iceland, from 60 to 61 degrees of latitude; after which, leaving them to the west, it steers northward, through 73, 74, and 75 deg. of latitude, where they begin to find the ice.

It is among these huge heaps of ice, wherewith the whole quarter is filled, that they first begin to spy the whales; and there most of the vessels fix their abode for the fishing. But as the fish are larger and fatter the farther north they go, some captains will venture as far as 80 or 82° of north lat. Each vessel of three hundred tons has six shalloops; and each shalloop has six harpooners, with five seamen to row it. To every shalloop there are seven lines, of three inches circumference; five of them in the hind part of the vessel, and two before. The hind lines together make six hundred fathoms, and, with the addition of the other two, eight hundred and eighty. If the whale dive deeper, or run farther underneath the ice than this stint, the line must be cut, lest the shalloop be drawn after it.

In the English whale-fishery every ship has six or seven boats; each of which has one harpooner, one boat-steerer, one manager of the line, and four seamen to row it. In each boat there are two or three harpoons, several lances, and six lines fastened together, each line being one hundred and twenty fathom long. To each harping-iron is fastened a strong stick, about six feet long, and a soft pliable line, about six fathom long, called the fore-gauger, which is fastened to the lines in the boat. When more line is wanted, the lines of a second boat are fastened to those of the first. See BALÆNA.

The instrument, wherewith the whale is struck, is a harping-iron, or javelin, five or six feet long, pointed with steel, in a triangular shape, like the barb of an arrow.

The harpooner, upon sight of the fish, from one end of the shalloop where he is placed, flings the harping-iron with all his might against his back: and, if he be so happy as to make it penetrate the skin and fat into the flesh, he lets go a string fastened to the harping-iron, at the end whereof is a dry gourd, which swimming on the water, discovers whereabouts the whale is; for the minute he is struck, he plunges to the bottom, commonly swimming against the wind.

If the whale return to breathe in the air, the harpooner takes occasion to give him a fresh wound, till, fainting by the loss of blood, the men have an opportunity of approaching him, and thrusting a long steeled lance under his gills into his breast, and through the intestines, soon dispatch him; and when the carcase begins to float, they cut holes in the fins and tail; and tying a rope in these holes, they tow him to the vessel, where he is fastened along the larboard side of the ship, floating upon his back almost level with the sea. They then begin to take the blubber or fat, and the fins as they are called, or whale-bone.

In order to this, several men stand upon the fish, with a kind of iron calkers, or spurs, to prevent their slipping, and cut off the tail, which is hoisted upon deck, and then cut out square pieces of blubber, weighing two or three thousand pounds, which are hoisted on board with the capstan, where each piece is again cut into smaller pieces each of two or three hundred pounds weight, and these are thrown into the hold, and left to drain for three or four days. When all the blubber is cut from the belly of the fish, it is turned on one side, by means of a piece of blubber, left in the middle, called the cant or turning-piece; and then they cut out this side in large pieces, called hockies, as before, and also the whale-bones with the gums, which are preserved entire, and hoisted on deck, where the blades are cut and separated, and left till they have time to clean and scrape them. The fish is next turned on his back, and the blubber cut out from the back and crown bone; and last of all they cut the blubber from the other side, as before. They then cut out the two large jaw-bones, situated in the under-lip, which are hoisted on deck, cleansed and fastened to the shrouds, and tubs are placed under them to receive the oil which they discharge; this oil belongs to the captain, and likewise the tail and fins. The carcase is left to float, and supplies food for Greenland birds, called mallemucks, &c. In three or four days, they hoist the pieces of blubber out of the hold, chop them, and put small pieces through the bung-holes into their casks.

A whale, the longest blade of whose mouth is nine or ten feet, generally fills thirty buts with blubber; but one of the largest fish will fill seventy buts and more. A good large whale is valued at about 1000l. sterling. A full ship of three hundred tons is worth, clear of all expense, at least 5000l. There is a premium assigned to every person in the ship for every whale: the captain has three guineas; the mate, one; each harpooner, one; the surgeon, one; carpenter, one; cook and boat-steerers, half a guinea each; a common man, a crown; and each boy, half a crown. The captain and harpooners have no wages: but the captain is allowed twenty-five pounds, and the harpooners, nine guineas each. In a successful voyage they they have six shillings for every ton of oil boiled in Greenland dock; but the rest of the ship's company have monthly wages, besides the fish-money, but no oil-money.

Nothing now remains, but to sail homewards, where the fat is to be boiled, and melted down into train-oil.

The whale-fishery of the Caroline islands is more easy and agreeable than that of all other places, and beside the great profit, affords a pleasant spectacle to multitudes of people on the shores.

There are ten or twelve of these isles disposed in form of a circle, so that they make a sort of port, in which the sea is perpetually calm and pleasant.

When a whale appears in this gulf, the people all get into their canoes, and rowing toward the sea, keep between the creature and its retreat, and drive him forward towards the isles at the bottom of the port. They drive him in this manner before them into the shallows, where they plunge into the water themselves, and some get ropes and chains about him, while others dart him with their spears. Their agility and address is wonderful in this. The creature can never get away when they have once got him fastened, but is soon killed, and got to the shore.

The whale-fishery begins in May, and continues through the months of June and July; but whether the ships have had good or bad success, they must come away and get clear of the ice by the end of August; so that in the month of September at farthest they may be expected home; but the more fortunate ships may return in June or July. See Balæna, Physeter, and Delphinus.

FISHES. See Pisces.

Fishes (Breeding of). Fishes are an object of general attention in regard to sport, food, and ornament. The first of these three heads, or that of sport, is the foundation of the art of Angling, and has already been discussed at some length under that article. The two remaining heads, which we shall now enter upon, relate chiefly to the breed of fishes, fishing-ponds, and fish-streams. In breeding fishes, there seems to be no small degree of caprice, for the most promising ponds do not always prove serviceable: one of the best indications of a breeding pond is, when there is good quantity of rush and grazing about it, with gravelly shoals, such as those of horse-ponds; so that when a water takes thus to breeding, with a few milters and spawners, two or three of each, a whole country may often be stocked in a short time. Eels and perches are of very good use to keep down the stock of fishes; for they prey much upon the spawn and fry, and generally destroy their superfluity of them. Pike, perch, tench, roach, &c. are observed to breed in almost any waters, and very numerously; eels never breed in standing waters, without springs; and in such, are neither found, nor increase, but by putting in; yet where springs exist, they are never wanting, though not put in. And which is truly extraordinary, no person ever saw in an eel the least token of propagation, either by melt or spawn; so that the mode of their breeding and propagation are questions mysterious, and unresolved. The fecundity of fishes is wonderful: a pike caught in the Rhine, weighing only nine pounds, had 148,000 ova in it; and Petit mentions a carp with upwards of 348,000.

In feeding fishes take the following remarks: —1. In a stew, thirty or forty carps may be kept up from October to March, without feeding; and by fishing with trammels or flews in March, or

April, you may take from your great waters to recruit the stews; but you must not fail to feed all summer, from March to October again, as constantly as cooped chickens are fed, and it will turn to as good an account.

2 The care of feeding is best committed to a butler or gardener, always at hand, because the constant and regular serving the stew conduces very much to the thriving of the fishes.

3. Boiled grain is rich to feed with, especially pease, and malt coarse ground; the grains after brewing, while fresh and sweet, are very proper; but one bushel of malt not brewed will go as far as two of grains; chippings of bread, and scraps off a table, steeped in tap droppings of strong beer or ale, are an excellent food for carp; and of these the quantity of two quarts to thirty carp every day is sufficient, and a small meal morning and evening is better than a larger once a day only.

4 There is a sort of food for fishes that may be called accidental, which is no less improving than the best that can be provided; and that is, when the ponds happen to receive the wash of commons, where many sheep have pastured; the water is enriched by the soil, and will feed a greater number of carp than it otherwise would do. In like manner, the dung that falls from cattle standing in the water in hot weather is a very valuable nutriment.

5. The most proper food to raise pikes to an extraordinary fatness is eels, without which it is not to be done but in a long time; small perches are the next best meat you can give them. Bream put into a pike-pond breed exceedingly, and are fit to maintain pikes, that will take care they shall not increase too largely; the numerous fry of roaches and rouds, which come from the greater pools into a pike's quarters, will likewise be a good diet for him.

6. Pike in all streams, and carp in hungry springing waters, being fed at certain times, will come up and take their meat almost from your hand; and it is diverting to see the greediness and contention that will exist among them for the good bits, with the boldness they will attain to by constant and regular feeding.

7. The most convenient feeding place is towards the mouth of the pond, at the depth of about half a yard; for by that means the deep will be kept clean and neat, as it were a parlour to retire to and rest in: the meat, thrown in this place into the water, without other trouble, will be picked up by the fishes, and nothing will be lost; yet there are several ingenious devices for giving them food, especially peas: as a square board let down with the meat upon it by the four corners, whence a string proceeds, made fast to the end of a stick, like a scale, which may be readily managed.

8. When fishes are fed in the larger pools or ponds, where their numbers are also great, there will require some expense as well as pains; but as soon as they are taken out, and it appears how much they have thriven, it will appear also how well both have been employed; either malt boiled or fresh grains is the best food in this case. Thus carp may be fed and raised like capons, and tench will feed as well, but perch are not proper for a stew in feeding time.

If cattle graze near your great pools, they will delight to come and stand in the water, which conduces much to the thriving of the cattle, as well as to the feeding of your fishes by their dunging, as has been already hinted: it is therefore advisable to have ponds in cow-pastures and grazing-grounds.

With respect to sowing oats in the bottom of a pond, take care to dry your great water once in three, or at most four, years, and that at the end of January, or beginning of March, which (if the year do not prove very unseasonable) will be time enough. After Michaelmas following, you may put in a great stock of fishes, and thin them in succeeding years, as the feed declines. See Pond.

In selecting a spot for ponds, it may be sufficient to observe here, that those grounds are best which are full of springs, or apt to be moorish: the one breeds fishes well, and the other preserves them from being stolen.

The situation of the pond is likewise to be considered, and the nature of the currents that fall into it; as also whether it can be refreshed from a little brook, or rain water falling from an adjacent hilly ground. Those ponds which receive the stale and dung of horses breed the largest and fattest fishes.

In forming the pond, observe that the head be placed at the lowest part of the ground; and that the trench of the flood-gate, or sluice, have a good swift fall, that it may not be long in emptying.

If the pond carry six feet of water, it is enough; but it must be eight feet deep to receive the freshes and rains that should fall into it.

It would also be advantageous to have shoals on the sides, for the fishes to sun themselves in, and lay their spawn on; and in other places, certain holes, hollow banks, shelves, roots of trees, islands, &c. to serve as their retiring places. If your pond be naturally adapted for breeding, never expect any large carps from it, as the greatness of the number of spawn will overstock it.

For large carps a store-pond is ever accounted the best: and, to make a breeding-pond become a store-pond, observe what quantity of carp it will contain; then put in all milters or all spawners, whereby in a little time you may have carps that are both large and exceedingly fat. Thus by putting in one sex alone, there is an impossibility of a farther increase, except in roaches, which, notwithstanding this precaution, will multiply. Reserve some great waters for the head-quarters of the fishes, whence you may take, or wherein you may put any quantity at pleasure. And be careful to have stews, and other auxiliary waters, so that you may convey any part of the stock from one to the other, and lose no time in the growth of the fishes, but employ your water, as you do your land, to the best advantage. View the grounds, and find out some fall between the hills, as near a flat as may be, so as to leave a proper current for the water. If there be any difficulty of judging of such, take an opportunity, after some sudden rain, or breaking up of a great snow in winter, and you will plainly see which way the ground casts; for the water will take the true fall, and run accordingly.

The condition of the place must determine the quantity of the ground to be covered with water. For example, fifteen acres in three ponds, or eight acres in two, and not less; and these ponds should be placed one above another, so that the point of the lower may almost reach the head or bank of the upper, which contrivance is no less beautiful than advantageous.

The head, or bank, which by stopping the current is to raise the water, and so make a pond, must be built with the clay and earth taken out of the pan, or hollow, dug in the lowest ground above the bank, the shape of the pan to be half an oval, whereof the flat to come to the bank and the longer diameter to run square from it.

For two large ponds of three or four acres apiece, it is advisable to have three or four stews, each two rods wide and three long. The stews are usually in gardens, or near the house, to be more handy, and better attended to. The method of making them, is to carry the bottom in a continual decline from one end, with a mouth to favour drawing the net.

FISHES. (Method of preserving for cabinets.) Linnéus's method is, to expose them to the air; and when they acquire such a degree of putrefaction that the skin loses its cohesion to the body of the fish, it may be slid off almost like a glove: the two sides of this skin may then be dried upon paper like a plant, or one of the sides may be filled with plaster of Paris to give the subject a due plumpness. A fish may be prepared, after it has acquired this degree of putrefaction, by making a longitudinal incision on the belly, and carefully dissecting the fleshy part from the skin, which is but slightly attached to it in consequence of the putrescency. The skin is then to be filled with cotton and some antiseptic powder, as directed for birds; and, lastly, to be sowed up where the incision is made. See PREPARATION OF ANIMALS.

FISHES, in heraldry, are the emblems of silence and watchfulness; and are borne either upright, imbowed, extended, endorsed respecting each other, surmounting one another, fretted, &c. In blazoning fishes, those borne feeding should be termed devouring; all fishes borne upright and having fins, should be blazoned hauriant; and those borne transverse the escutcheon, must be termed naiant.

FISHGARD, or FISCARD, a seaport town of South Wales, in the county of Pembroke, at the mouth of the river Gwaine, on a bay of St. George's Channel, to which it gives name, where vessels may ride safely in five or six fathoms water. The inhabitants carry on a good trade in herrings, of which they, with Newport, cure above 1000 barrels annually. Lon. 4. 58 W. Lat. 51. 55 N.

FI'SHFUL. *a.* (from *fish.*) Abounding with fish; stored with fish (*Camden*).

To FI'SHIFY. *v. a.* (from *fish.*) To turn to fish: a cant word (*Shakspeare*).

FISHING, in general, the art of catching fishes, whether by means of nets, of spears, or of the line and hook. That which is performed by the net, spear or harpoon, for fishes that go in shoals, has been explained in the preceeding articles. That performed by the rod, line, and hook, for solitary fish, is usually termed angling.

FISHING (Chinese). We venture to give this appellation to some very ingenious contrivances of the people of China for catching in their lakes, not only fishes, but water-fowl. For the purpose of catching fish they have trained a species of pelican, resembling the common corvorant, which they call the Leu-tze, or fishing-bird. It is brown, with a white throat, the body whitish beneath, and spotted with brown; the tail is rounded, the irides blue, and the bill yellow. Sir George Staunton, who, when the embassy was proceeding on the southern branch of the great canal, saw those birds employed, tells us, that on a large lake, close to the east side of the canal, are thousands of small boats and rafts, built entirely for this species of fishery. On each boat or raft are ten or a dozen birds, which, at a signal from the owner, plunge into the water; and it is astonishing to see the enormous size of fishes with which they return, grasped within their bills. They appeared to be so well trained, that it did not require either ring or cord about their throats to prevent them from swallowing any portion of their prey, except what their master was pleased to return to them for encouragement and food. The boat used by these fishermen is of a remarkably light make, and is often carried to the lake, together with the fishing birds, by the men who are there to be supported by it.

The same author saw the fishermen busy on the great lake Wee-chaung-hee; and he gives the following account of a very singular method practised by them for catching the fish of the lake without the aid of birds, of net, or of hooks.

To one side of a boat a flat board, painted white, is fixed, at an angle of about 45 degrees, the edge inclining towards the water. On moonlight nights the boat is so placed that the painted board is turned to the moon, from whence the rays of light striking on the whitened surface, give to it the appearance of moving water; on which the fishes being tempted to leap, as on their element, the boatmen, raising with a string the board, turn the fishes into the boat.

Water-fowl are much sought after by the Chinese, and are taken upon the same lake by the following ingenious device. Empty jars or gourds are suffered to float about upon the water, that such objects may become familiar to the birds. The fowler then wades into the lake with one of those empty vessels upon his head, and walks gently towards a bird; and lifting up his arm, draws it down below the surface of the water without any disturbance or giving alarm to the rest, several of whom he treats in the same manner, until he fills the bag he had brought to hold his prey. The contrivance itself is not so singular, as it is that the same exactly should have occurred in the new continent, as Ulloa asserts, to the natives of Carthagena, upon the lake Cienega de Tefias.

FISHING-FLIES, are both natural and artificial; the natural are almost innumerable, and of these the chief are, the dun-fly, the stone or may-fly, the tawny-fly, the vine-fly, the shell-fly, the cloudy and blackish fly, the stag-fly; next caterpillars, canker-flies, bear-flies, &c. all which appear either sooner or later, according as the spring proves forward or tardy; and these flies are all good in their season, for fishes that rise at the fly.

The better to know the fly the fish covets most, when you come to the river side in the morning, beat the bushes with your rods, and take up as many various sorts as you can, and make a trial of them: upon many of them we have already made some remarks in the article ANGLING; and to this article we still refer our readers; for though they will sometimes change their fly, this is only when they have glutted themselves with that sort they like best.

There are two ways of fishing with these natural flies, viz. either on the surface of the water, or a little underneath it.

If you angle for chevin, roach, or dace, move not the natural fly swiftly when you see the fish make at it, but rather let it glide freely towards him with the stream; but if it be in a still and slow water, draw the fly slowly side-ways by him, and this will induce him to pursue it eagerly.

The artificial fly is seldom used but in blustering weather, when the waters are so disturbed by the wind, that a natural fly cannot well be seen, nor rest upon them.

There are twelve sorts of dubs or artificial flies, of which the following are the principal:—

1. For March, the dun-fly; made of dun-wool, and the feathers of the partridge's wing; or the body made of black wool, and the feathers of a black drake.

2. For April, the stone-fly; the body made of black wool, dyed yellow under the wings and tail.

3. For the beginning of May, the ruddy fly; made of red wool, and bound about with black silk, with the feathers of a black capon hanging dangling on his sides, next his tail.

4. For June, the greenish fly; the body of black wool, with a yellow list on either side, the wings taken off the wings of the buzzard, bound with black broken hemp.

5. The moorish-fly; the body of duskish wool, and the wings of the blackish mail of the drake.

6. The tawny-fly, good till the middle of June; the body made of tawny wool, the wings in opposition to each other, of the whitish mail of a white drake.

7. For July, the wasp-fly; the body of black wool, cast about with yellow silk, and the wings of the drake's feathers.

8. The steel-fly, good in the middle of July; the body of greenish wool, cast about with the feathers of a peacock's tail, and the wings of those of the buzzard.

9. For August, the drake-fly; the body of black wool cast about with black silk, his wings of the mail of a black drake, with a black head. For the different kinds of FISHES and directions for taking them, see each under its proper article.

Directions for artificial Fly-Fishing.

1. Fish in a river that has been somewhat disturbed by rain, or in a cloudy day, when the waters are moved by a gentle breeze; if the wind be low, the best angling will be in swift streams, but if it blow rather strong, yet not so but that you may conveniently guard your tackle, the fish will rise in plain deeps.

2. Always angle with a small fly and clear wings, in clear rivers; but use larger in muddy places.

3. Keep at as good distance from the water-side as you can, and fish down the stream with the sun in your face, and touch not the water with your line.

4. When the water becomes brownish after rain, use an orange fly; and in a clear day, a light-coloured fly, and a dark fly for dark waters, &c.

5. Have several of the same of every sort of flies differing in colour, to suit the colour of different waters and weathers.

6. Let the fly fall first into the water, and not the line, which last would be apt to frighten the fish.

7. Let your line be twice the length of your rod, unless the river be encumbered with wood.

8. In slow rivers, or still places, cast the fly across the river, and let it sink a little in the water, and draw it gently back with the current.

9. Use a quick eye and nimble hand, in striking with the rising of the fish, lest he should have time to reject the hook.

All who delight in fly-fishing should especially learn the way of making the two chief sorts of artificial flies, the palmer, ribbed with silver or gold, and the may-fly.

In making the palmer-fly, arm your line on the inside of the hook, and cut off as much of a mallard's feathers to make the wing as you find necessary.

Then lay the outer part of the feather next the hook, and the point of the feather towards its shank, whip it three or four times about the hook with the same silk you armed your hook with, and make the silk fast.

Take the hackle of the neck of a cock or capon, (but a plover's top is preferable) and strip off one side of the feather, and then take the hackle, silk, or gold or silver thread, and make all fast at the bent of the hook, working them up to the wings, shifting your fingers at every turn, and then stopping: the gold will in this way fall right, and must be made fast.

After this, take the hook betwixt your fingers and thumb, in the left hand, and with a needle or pin part the wings in two; next with the arming silk (having fastened all hitherto) whip it about as it falls across between the wings, and with your thumb turn the point of the feather towards the bent of the hook, then work it three or four times about the shank, and fasten it; and view the proportion for other flies.

If you make the grounds of hog's wool, sandy, black, or white, or bear's wool, or of a red bullock, work these grounds on a waxed silk, and arm and set on the wings as before directed.

The body of the may-fly must be wrought with some of these grounds, and will appear admirably well, when ribbed with black hair or silk.

Others make their flies with sandy hog's wool, ribbed with black silk, and winged with a mallard's feather, according to the angler's fancy.

The oak-fly must be made with orange tawny, or orange coloured crewel, black for the body, and the brown of the mallard's feathers for the wings.

There is also another fly, the body of which is made of the strain of a peacock's feather.

March is the month in which to begin fly-fishing, but if the weather prove windy or cloudy, there are several sorts of palmers that are good at that time: the first is a black palmer ribbed with silver; the second, a black palmer with an orange tawny body; a third, whose body is all black; and a fourth a red palmer, ribbed with gold, and a red hackle, mixed with orange crewel.

Observe, that the lightest flies are for cloudy and dark weather, and the darkest for bright and light, and the rest for indifferent seasons.

Salmon flies should be made with their wings standing one behind the other, whether two or four, and of the gaudiest colours that can be, for he delights in such; and this chiefly in the wings, which must be long as well as the tail.

There are twelve kinds of artificial flies for angling with upon the top of the water, and the fittest season for using these, is a blustering windy day, when the waters are so troubled that the natural fly cannot be seen, or rest upon them. The first is the dun-fly of March, the body of which is made of dun-wool, the wings of the partridge's feathers. The second is another dun-fly, the body of black wool, and the wings of the black drake's feathers, and of the feathers under his tail. The third is the stone-fly of April, the body of black wool, made yellow under the wings and under the tail, from the wings of the drake. The fourth is the ruddy fly of the beginning of May, the body of red wool wrapt about with black silk; the feathers from the wings of the drake, with the feathers of a red capon also, which hang dangling on his sides next the tail. The fifth, the yellow or greenish fly, in May likewise; the body made of yellow wool, and the wings of the red cock's hackle or tail. The sixth, the black fly, in May also; the body of black wool, and lapt about with the herle of a peacock's tail; the wings of the wings of a brown capon, with his blue feathers in his head. The seventh, the sad yellow fly in June; the body of black wool, with a yellow list on either side, and the wings from the wings of a buzzard, bound with black braked hemp. The eighth, the moorish-fly; the body of duskish wool, and the wings of the blackish male of the drake. The ninth, the tawny-fly, good until the middle of June; the body of tawny wool, the wings contrary opposed to each other, of the whitish male of the wild drake. The tenth, the wasp-fly in July; the body made of black wool, lapt about with yellow silk, the wings of the feathers of the drake or of the buzzard. The eleventh, the shell-fly, good in Mid-July; the body of greenish wool, lapt about with the herle of a peacock's tail, and the wings of the wings of a buzzard. The twelfth, the dark drake-fly, good in August; the body with black wool, lapt about with black silk: his wings of the peacock's feather, and grounds of such wool and crewel as may form the grasshopper; and remember that usually the smallest flies are the best; as also, that the light fly commonly makes most sport in a dark day, and the darkest and least fly in a bright or clear day; lastly, you are to repair upon any occasion to your magazine-bag, and vary and make them lighter or darker according to your fancy or the appearance of the day.

The May-fly may be found in and about that month, near river sides, especially against rain; the oak-fly on the butt or body of an oak or ash, from the beginning of May to the end of August; it is a brownish insect, easy to be discovered, and appears usually with its head downwards towards the root of the tree; the small black-fly, or hawthorn-fly, is to be had on any hawthorn-bush after the leaves are off. With these and a short line you may dap or dop, behind a tree, or in any deep hole, still making it move on the top of the water as if it were alive, and keeping yourself out of sight; by which you will certainly have sport if there be trout.

The two chief salmon-flies are the dragon and the king's-fisher, about two inches long, which may be supplied according to fancy, from the most gaudy feathers that exist, especially from the peacock's; for they will rise at any thing gaudy, and, where they are plentiful, at trout-flies

There are likewise two moths, great killers about twilight in a serene evening, and the humble-bee a famous chub-killer for any time of the day. They are dubbed in the following manner: the brown moth must be winged from the feather of a brown owl, dubbed with light mohair, with a dark grizzle cock's hackle for the legs, and a red head. The white moth, dubbed with the white strands of an ostrich's feather, its wings of the feather of a white pigeon's wing, a white hackle for the legs, and a black head.

The humble-bee, dubbed with black spaniel's fur, a black cock's hackle whipped over it, the tag of the tail to be of a deep orange colour, and the wings of the feather made of a crow's wing.

Fishing-pastes are variously compounded, almost according to the angler's own fancy; but there should always be a little cotton wool, shaved lint, or fine flax intermixed, to keep the parts together, that it may not fall off the hook. White bread and honey will make a proper paste for carp and tench: fine white bread alone, with a little water, will serve for roach and dace: and mutton suet, and soft new cheese, for barbel. Strong cheese, with a little butter, and coloured yellow with saffron, will make a good winter paste for chub.

To make the Palmer and May-Fly.

In the first place, lay the following materials at your side: half a yard of fine round even silk-worm gut, half a yard of red silk, well waxed with wax of the same colour, a hook and needle, some strands off an ostrich's feather, and a fine red hackle; then take the hook, and hold it by the bent between the fore-finger and thumb of your left hand, and with the point and beard of the hook not under your fingers, but nearly parallel with the tops of them; afterwards take the silk and hold it likewise about its middle with your hook, one part lying along the inside of it to your left hand, the other to your right; then take that part of the silk which lies towards your right hand, and, holding the part towards your left tight along the inside of the hook, whip that to the right three or four times round the shank of the hook towards the right hand; after which take the silk-worm gut, and lay either of its ends along the inside of the shank of the hook, till it come near the bent; then hold the hook, silk, and gut, tight between the fore-finger and thumb of your left hand, and afterwards give the part of the silk to your right hand three or four times more over both hook and gut till it come near the end of the shank, and make a loop and fasten it tight; then whip it neatly again over both silk and gut and hook till it come near the bent of the hook, after which make another loop, and fasten it again; then, if the gut should reach further than the bent of the hook, cut it off, and your hook will be whipped on, and the parts of the silk hang from the bent of it.

Having proceeded thus far, wax the longest end of the silk again, and take three or four strands of an ostrich's feather; and holding them and the hook as in the first position, the feathers to the left hand, and the roots of them in the bent of the hook, with the silk that you waxed last, whip them three or four times round; make a loop, and fasten them tight: then turning the strands to the right hand, and twisting them and the silk together with the fore-finger and thumb of your right hand, wind them round the shank of the hook till you come to the place where you first fastened, then make a loop, and fasten them again; if the strands should not be long enough to wind as far as is necessary round the shank, when the silk gets bare you must twist others over it. Having performed this, take your scissors, and cut the body of the palmer into an oval shape, that is, small at the bent and the end of the shank, but full in the centre; but be careful not to cut too much of the dubbing off. Both the ends of the silk being now separated, one at the bent, another at the end of the shank, wax them both again; then take the hackle, hold the small end of it between the fore-finger and thumb of your left hand, and stroke the fibres of it with those of your right, the contrary way from which they are formed; hold your hook as in the first position, and place the point of the hackle in its bent, with that side which grows nearest the cock upwards; and then whip it tight to the hook; but in fastening it, tie as few fibres in as you can: the hackle being fast, take it by the great end, and, keeping the side nearest the cock to the left hand, begin with your right to wind it up the shank upon the dubbing; stopping every second turn, and holding what you have wound tight with your left fingers, whilst with the needle you pick out the fibres you have unavoidably taken in; proceed in this manner till you come to the place where you first fastened, and where there is an end of the silk; then clip off those fibres of the hackle which you held between the finger and thumb, close to the stem; and hold the stem close to the hook; after that take the silk in your right hand, and whip the stem very fast to the hook; then make a loop, and fasten it tight. Take your penknife; and if the part of the stem next the shank of the hook be as long as that of the hook which is bare, pare it fine, wax your silk, and bind it neatly upon the remaining bare part of the hook; then fasten the silk tight, and spread some shoe-maker's wax very lightly on your last binding; after that clip off the ends of the remaining silk, both at the shank and bent of the hook, and all fibres that start or stand ill-conditioned, and the whole is completed. This is called the palmer-fly, or plain hackle, and may, instead of the ostrich's feather above-mentioned, be dubbed with black spaniel's fur. It is an excellent killer. There are three more palmers, which are all to be made in the same manner, only with different articles, which are as follow: When you make the palmer-fly, suit the colour of the silk to the hackle you dub with; a dun hackle requires yellow silk; a black hackle, sky-blue silk; a brown or red hackle, red silk; when you make flies that are not palmers, dub with silk that resembles the colour most predominant in the fly; and in making your flies, remember to mix bear's hair and hog's down with your other dubbing, because they repel the water; make your flies always in hot sun-shiny weather, for your waxed silk will then draw kindly, and when you take the dubbing to imitate a fly, always wet it, and then you will be perfect in your imitation; for, though the dubbing when dry may suit, when it is wet it may be quite another colour. Marten's fur is the best yellow you can use.

Great Palmer, or *Hackle*. Dubbed the same as the plain hackle, with the strands of an ostrich's feather, or a black spaniel's fur, and warped with red peacock's hackle untrimmed, that is, leaving the whole length of the hackle staring out (for sometimes the fibres of the hackle are to be shortened all over, sometimes barbed only a little, and sometimes close underneath) with the whole length of fibres on the top or back of the fly, which makes it swim better; and in this manner on a whirling water, it will kill large fishes.

Golden Palmer, or *Hackle*. The same dubbing, ribbed with gold-twist, and a red hackle over all.

Silver Hackle. Made with a black body also, silver twist above, and a red hackle over all.

The variation that is to be observed in making the gold and silver palmers is this, that when you whip the end of the hackle to the bent of the hook, do the same also to the gold or silver twist, and first wind either of them on the dubbing, observing that they lie flat on it, and then fasten off; afterwards proceed with the hackle as directed; or wind the hackle on the dubbing first, and rib the body with either of the twists afterwards.

These are the standard hackles in fly-fishing, and are taken any month in the year from nine to eleven in the morning, and from one to three in the afternoon, and upon any water; though you must have different sizes of them, and dubbed with different colours, that you may always be able to suit either a dark or clear water, or a bright or cloudy atmosphere; observing that small light-coloured flies are for clear waters and skies, and the larger for dark and cloudy ones. The angler should always try the palmers first, when he fishes in a river that he is unaccustomed to; even in that which he constantly uses, unless he knows what fly is on the water, and it should not be changed till he does know. See Nat. Hist. Pl. XC. XCI. XCII.

FISHING-FROG, in ichthyology. See LOPHIUS.

FISHING-STREAMS. The chief sporting-rivers for this purpose in England are the Thames, Severn, Trent, Tyne, Tweed, Medway, Tees, Dove, Isis, Tame, Willey, Avon, Lea, Trevel, Nen, Welland, Darwent, Calder, Wharf, Nid, Don, Swale, Hull, Ouse, and Are. The rivers in Wales are reckoned at above two hundred, the principal of which are the Dee, Wye, Conway, Tivy, Chedleyday, Cluid, Usk, Tovy Taff, and Dovy. Several rivers in England run under ground, and then rise again, as a branch of the Medway in Kent; the Mole in Surrey; Hans in Staffordshire; the little rivers Allen in Denbighshire, and Deveril in Wiltshire: the river Recall hides itself under ground near Elmsley in the North Riding of Yorkshire: at Chelder near Axbridge, in Somersetshire, is a spring that drives twelve mills in a quarter of a mile. In the midst of the river Nen, south of Peterborough, in Northamptonshire, is a deep gulph called Medeswell, so cold, that in summer no swimmer is able to endure it, yet it is not frozen in the winter.

Of all these rivers, we shall chiefly notice the Thames, as well because it is the largest, and noblest, as because it affords the greatest diversity of sporting. The higher an angler goes up the Thames, if within about four miles from London, the more sport and the greater variety of fishes he will meet with; but as few citizens go so far from home, we shall mention the best places for angling from London-bridge to Chelsea: but remember that if the air be cold and raw, the wind high, the water rough, or if the weather be wet, it is totally useless to angle in any part of the Thames, but when the sky is serene, the air temperate, and the water smooth, you may expect success. Remember also that the proper hours for angling are from the time that the tide is half ebbed, to within two hours of high-water, provided the land-floods flow. Always pitch your boat under the wind; that is, if the wind be in the south, always keep on the Surrey shore; if north, on the London side.

The best places then for pitching a boat to angle in the Thames, are about one hundred and fifty yards from York-stairs, the Savoy, Somerset-house, Dorset-stairs, Blackfriars-stairs, the Dung-wharf near Water-lane, Trig-stairs, and Essex-stairs. On the Surrey side, Falcon-stairs, Barge-houses, Cuper's, *vulgo* Cupid's stairs; the Wind-mill, and Lambeth.

When you go to angle at Chelsea, on a calm, fair day, the wind being in a right corner, pitch your boat almost opposite to the church, and angle in six or seven feet water, where, as well as at Battersea-bridge, you will meet with plenty of roach and dace.

Mortlake deeps are the next place where roach principally resort, when the weeds are rotten: and here good carp are very often taken.

From the sides of the Aits, opposite to Brentford, Isleworth, and Twickenham, there is famous angling for roach, dace, gudgeons and perch; very often you will meet with trout and carp.

Teddington banks are remarkable for good gudgeons, roach, &c.

Kingston-wick and Kingston are famous for barbel, roach, and dace.

At Hampton and Sudbury there is good angling for barbel, roach, dace, chub, gudgeons, and skeggers: and from the Aits for trout and perch.

Walton-deeps and Shepperton-pool abound with large barbel and dace.

At and about Windsor is a vast variety of all sorts of fishes; but if a man be found angling in another's water (without leave) he is fined very high by the court of that town, if he only catch a single gudgeon.

Of the rivers that empty themselves into the Thames, and of others which are not far from it, we may observe as follows:

1. In Ilford-river, the upper part abounds with roach, dace, and some perch; but between Ilford and the Thames, especially about three miles from that town, there is pike.

2. Woodford-river is stored with perch, chub, roach, and dace.

3. Stratford-river affords the angler good diversion for roach, dace, chub, perch, &c.

4. Bow-river has the same fishes in it as the Stratford-river.

5. Hackney-river has plenty of large barbel, chub, roach, dace, gudgeon, eels, and lampreys. In this river the barbels, eels, and gudgeons, are very fine.

6. Waltham-river, besides large barbel, chub, roach, dace, gudgeon, and eels, has good store of fine pike, and some carp.

7. The New-river is pretty well stored with chub, roach, dace, gudgeon, and eels.

8. Brentford-river was a good one formerly, but is now much abused by poachers; yet the angler may meet with some chub, roach, dace, and perch.

9. Hounslow-river is well stored with roach, dace, perch, pike, and gudgeon.

The Powder-mill-tail, near Hounslow, is an excellent place for angling.

10. Colne-river abounds with chub, roach, dace, perch, trout, and pike.

11. Uxbridge-river is excellent for large eels and fat trouts: but, as the water is rented, not only leave must be obtained to angle in it, but must pay so much per pound for what you kill. Denham, near Uxbridge, is a very famous place.

These all lie north of the Thames: on the south we shall notice,

1. Deptford-river, now very much decayed, and having but few fishes in it, as roach, dace, and flounders: though by chance you may meet with a trout.

2. Lewisham-river, in which are some good trouts, large roach, chub, gudgeon, perch, and dace.

3. Wandsworth-river, well stored with gudgeons, dace, flounders, perch, pike, and some carp and trouts; very large silver eels are often taken here.

4. Mitcham-river, its principal fish is trout.

5. Martin-river, trout also.

6. Carshalton-river, abounding with trout and other white fishes.

7. Moulsey-river, yielding perch, jacks, roach, dace, chub, gudgeons, eels, flounders, barbels, and trouts.

8. Esher-river, good for jacks, perch, chub, roach, dace, gudgeons, eels, flounders, barbels, and trouts.

9. Cobham-river, stored with plenty of good trout, fat and large, as also dace, perch, chub, jacks, and gudgeons.

10. Weybridge-river, affording good diversion for carp, some of which weigh eight or nine pounds; also jack, roach, dace, flounders, popes, large bleak, barbel, and gudgeons.

11. Byfleet-river, in which are very large pikes, jack, and tench; perch, of eighteen inches long; good carp, large flounders, bream, roach, dace, gudgeons, popes, large chub, and eels.

FISHING-WILES. Fishes are enticed by peculiar odours, and may in consequence be taken with ease. For this purpose, mix the juice of houseleek with nettles and cinquefoil chopped small, rub your hands with the mixture, and distribute it in quantities in the water; put your hand into the water, and the fishes will suffer themselves to be taken with ease.

Fishes may be drawn into any place or part of a river, by throwing in the following composition:—Take goat's, bullock's, and sheep's blood, which is found curdled among the entrails in the body of the animal fresh killed; pound well with these, thyme, marjoram, origan, flour, garlic, wine-lye, and suet, and let the whole be made into masses or large bolusses; these must be scattered into the pond discretionally, where you wish to entice the fish.

Pound nettles with joubarbe and a small quantity of cinquefoil grass; to these add wheat boiled in marjoram, and thyme water; pound the whole together, and drop it into the net.

Take heart-wort and slack-lime, make them into a paste, which throw into standing water; this will fix them, and cause them to be taken at pleasure.

Make a paste of coculus indicus, cummin, old cheese, wine-lye, and wheat flour; throw small pieces of it into clear and undisturbed parts of the pond or river, and every fish that swallows one of these bolusses will become so intoxicated as to swim upon the surface of the water, and suffer itself to be taken. This intoxication will cease in a short time; hence those who use this method must take them quickly.

A pond at Faringdon, in Berkshire, which was well stocked with carp, tench, and perch, was poisoned in this manner in the night, and in the morning most of the fishes were found floating on the surface of the water. They were taken out and put into a small stewpond full of clear spring water, when the carp and tench recovered, but all the perch died; but this might possibly be owing to the coldness of the water. See the article STEW.

Take fishers' berries, pound them in a mortar, and with water make them into a paste; throw pills of this into the water, and it will have the same effect as the former.

Pound marjoram, marigolds, wheat flour, and rancid butter, and it will allure fishes of all kinds to the net.

Take gum ivy, and put a good deal of it into a box made of oak, and rub the inside of it with this gum. When you angle put three or four worms into it, but they must not remain there long; for if they do it will kill them: then take them out, and fish with them, putting more in their place, as you may want them, out of your worm bag. Gum ivy is a tear which drops from the body of large ivy trees, on being wounded, and is of a yellowish red colour, of a strong scent, and sharp taste; that which is sold in the shops is counterfeit, and good for nothing. Therefore, to get gum ivy, about Michaelmas, or in the spring, drive several great nails into large ivy stalks, wriggle the same till they become very loose, and let them remain, and the gum will thence issue. Slit also, at the same seasons, several great ivy stalks, and visit them once a month, and gather the gum which flows from the wounded part. This will very much improve the angler's success.

Take assafetida three drachms, camphor one, Venice-turpentine one, pound the whole together in a mortar, with some drops of oil of lavender or spike. When you angle anoint eight inches of your line with it, next your hook, and it will prove excellent for a trout in muddy water, and for gudgeons in clear.

Dissolve gum ivy in oil of spike, and anoint your bait for a pike with it, and he will take it the sooner.

Take heron's fat, the best assafetida, and mummy, finely powdered, of each two drachms; cummin-seed, finely powdered, two scruples; camphor, galbanum, and Venice-turpentine, of each one drachm, civet two grains. Make them into a thinnish ointment, with oils of lavender, aniseed, and camomile, and keep the mixture in a narrow-mouthed and well-glazed gallipot, close covered with a bladder and leather, and it may be preserved two years. When you want to use it, put some into a small taper pewter box, and anoint your line with it, about eight or nine inches from the hook, and when it is washed off repeat the unction.

Take fresh horse-dung, and put it into a bag, or net, throw it into the water, and the fishes will gather about it.

Boil barley in water till it bursts, then boil it with liquorice, a little mummy and honey; beat all together in a mortar, till it is stiff as paste, which put into boxes close stopped; when you fish, take about the quantity of a walnut of it, and boil in an earthen pot, with two handfuls of fresh barley, and a little liquorice, leaving it till it is almost dry; then throw it into the places where you would have the fish come, and they will gather together.

Take the herb dragon-wort, from which extract the juice, with it rub your hands, and fishes will approach and suffer themselves to be taken in the water; the proper hour for fishing is from five till six in the morning.

Take a piece of heron's flesh, and put it into a bottle close covered wih clay, or wax, with some musk, amber, and civet, put the pot into a kettle full of water, and make it boil till you are sure the flesh is converted into oil, then take out the bottle, and pour out the oil; with which rub your line, and all the fish will come to be taken.

Take fat of a heron, mummy, galbanum, each two drachms, musk one grain, aqua vitæ two ounces; mix all together in an earthen porringer over a gentle fire, and stir till it is thick; keep it in a leaden porringer, and with it rub the hook, or the ends of the line, or cork, and the fish will come so that you may take them with your hands.

Take the belly of a heron, that is, the bowels or entrails, cut in pieces, and put it into a glass phial, which stop close with wax: then bury it in hot horse-dung, and let it turn to oil, which will be within ten or fifteen days; then take an ounce of assafetida, and mixing it with the oil, it will all thicken like honey; with which anoint your line, stick, or rod, or the bait you put upon the hook.

FI'SHKETTLE, *s.* (*fish* and *kettle.*) A caldron made long for the fish to be boiled without bending (*Grew*).

FI'SHMEAL. *s.* Diet of fish (*Sharp*).

FI'SHMONGER. *s.* A dealer in fish (*Carew*).

FI'SHY. *a.* (from *fish.*) 1. Consisting of fish. 2. Inhabited by fish (*Pope*). 3. Having the qualities or form of fish (*Brown*).

FI'SSILE. *a.* (*fissilis*, Latin.) Having the grain in a certain direction, so as to be cleft (*Newton*).

FISSI'LITY. *s.* (from *fissile.*) The quality of admitting to be cloven.

FISSU'RA MAGNA SLYLVII The anterior and middle lobes of the cerebrum on each side are parted by a deep narrow sulcus, which ascends obliquely backwards, from the temporal ala of the os sphenoides, to near the middle of the os parietale, and this sulcus is thus called.

FI'SSURE. *s.* (*fissura*, Latin; *fissure*, French.) A cleft; a narrow chasm where a breach has been made (*Woodward*).

To Fissure. *v. a.* (from the noun.) To cleave; to make a fissure (*Wiseman*).

Fi'ssure. (*fissura.*) In surgery, the species of fracture in which the bone is slit, but not completely divided.

FIST. *s.* (ꝼıꞅꞇ, Saxon.) The hand clenched with the fingers doubled down (*Denham*).

To Fist. *v. a.* 1. To strike with the fist (*Dryden*). 2. To gripe with the fist (*Shakspeare*).

FISTELLA, a fortified town of Morocco, whose inhabitants carry on a brisk trade in fine garments. Lat. 32. 27 N. Lon. 5. 55 W.

FISTIC NUT. See Pistachio nut.

FI'STICUFFS. *s.* (*fist* and *cuff.*) Battle with the fist; blows with the fist (*More*).

FISTUCA, in antiquity, a wooden instrument used in driving piles, and fitted with two handles.

FISTULA. (*fistula*, *quasi fusula*, from *fundo*, to pour out.) A term in surgery, applied to a long and sinuous ulcer that has a narrow opening, and sometimes leads to a larger cavity.

Fistula lachrymalis. See Surgery.

Fistula, in ancient music, a wind instrument. Some of these had holes, others none: some consisted of a single pipe, others of many.

Fistula panis, pipes of Pan, or mouth-organ, consists of a range of pipes bound together side by side, and gradually lessening with respect to each other, in length and diameter. The longest pipe is about six inches, and the shortest about two inches in length. In performance it is held in the hand, and the pipes are blown into by the mouth at one end.

Fistula pastorica, the name given by Cicero, and others, to the oaten pipe used, by the audience at the Roman theatres, to express their disapprobation.

FI'STULAR. *a.* (from *fistula.*) Hollow like a pipe.

FI'STULARIA. Tobacco-pipe-fish. In zoology, a genus of the class pisces, order abdominales. Snout cylindrical; jaws distant from the eyes; gill membrane with seven rays: body round, gently tapering from the jaws to the tail. Three species as follow:

1. F. tabacaria. Tail bifid; ending in a slender, taper whip, of the consistence of whale-bone, and about four inches long from the middle of it. Inhabits America and Japan: is about a foot long, and has the general appearance of an eel: lives on smaller fishes, sea-insects and worms, which it dextrously drags from the cavities of rocks by the peculiar construction of its snout. See Nat. Hist. Pl. CXV.

2. F. chinensis. Tail rounded without the long appendage of F. tabacaria. Inhabits India: longer than the former; habits much the same.

3. F. paradoxa. Body reticulate with prominent lines; tail lanceolate. Inhabits Amboyna: two inches long: has some resemblance to a syngnathus; body whitish-ash, with obsolete brown rivulets; the first dorsal fin and tail blackish; compressed and spinous at the intersections of the lines; back perfectly triangular; belly towards the ventral fins nearly triangular, and behind them narrow, and equally six-sided; tail slenderer, compressed, and seven-sided.

FISTULOUS STEM, in botany, hollow like a pipe or reed. Opposed to farctate, stuffed or full. Fistulosum folium, a fistulous leaf; as in œnante fistulosa; and fistulous nectary; as in aconitum.

FIT. *s.* 1. A paroxysm or exacerbation of any intermittent distemper (*Sharp*). 2. Any short return after intermission; interval (*Rogers*). 3. Any violent affection of mind or body (*Spenser*). 4. Disorder; distemperature (*Shakspeare*). 5. It is used for the hysterical disorders of women, and the convulsions of children.

Fit. *a.* 1. Qualified; proper (*Cowley*). 2. Convenient; meet; proper; right (*Addison*).

To Fit. *v. a.* (*vitten*, Flemish.) 1. To accommodate to any thing; to suit one thing to another (*Denham*). 2. To accommodate a person with any thing (*Wiseman*). 3. To be adapted to; to suit any thing (*Boyle*). 4. *To* Fit *out.* To furnish; to equip (*Dryden*). 5. *To* Fit *up*. To furnish; to make proper for the use or reception of any (*Pope*).

To Fit. *v. n.* To be proper; to be becoming.

Fits of easy reflection, &c. in optics. Sir Isaac Newton calls the successive disposition of a ray to be reflected through different thicknesses of a plate of air, or any other substance, the returns or fits of easy reflection, and the disposition of the same ray to be transmitted in the same manner through the intervening spaces, returns or fits of easy transmission. Thus, a ray of light is in a fit of easy reflection, when it falls on a plate of any kind of matter, whose thickness is one of the terms of the series 1, 3, 5, 7, &c. taking the smallest thickness capable of reflecting such ray for unit; and, in the same way, it is in one of its fits of easy transmission when the thickness is one of the terms of the series 2, 4, 6, 8, &c. See Optics.

FITCH. *s.* A small kind of wild pea, commonly *vetch*. See Cicer.

FITCHET, in mastiology. See Viverra

FI'TFUL. *a.* (*fit* and *full.*) Varied by paroxysms (*Shakspeare*).

FI'TLY. *ad.* (from *fit.*) 1. Properly; justly; reasonably (*Tillotson*). 2. Commodiously; meetly (*Donne*).

FI'TMENT. *s.* (from *fit.*) Something adapted to a particular purpose: not used (*Shakspeare*).

FI'TNESS. *s.* (from *fit.*) 1. Propriety; meetness; justness; reasonableness (*Hooker*). 2. Convenience; commodity; the state of being fit (*Shakspeare*).

FI'TTER. *s.* (from *fit.*) 1. The person or thing that confers fitness for any thing (*Mortimer*). 2. A small bit (from *fetta*, Italian.)

FITZ. *s.* (Norman.) A son; as *Fitzherbert*, the son of Herbert; *Fitzroy*, the son of the king. It is commonly used of illegitimate children.

FITZHERBERT (Sir Anthony), a very learned lawyer in the reign of king Henry VIII. was descended from an ancient family, and born at Norbury in Derbyshire. He was made one of the judges of the court of common-pleas in 1523, and distinguished himself by many valuable works, as well as by such an honourable discharge of the duties of his office, as made him esteemed an oracle of the law. His writings are, The Grand Abridgement; The Office and Authority of Justices of Peace; The Office of Sheriffs, Bailiffs of Liberties, Escheators, Constables, Coroners, &c.; Of the Diversity of Courts; The New Natura Brevium; Of the Surveying of Lands; and The Book of Husbandry. He died in 1538.

FIVE. *a.* (ꝼiꝼ, Saxon.) Four and one; half of ten. The number five has this peculiar property, that when multiplied by an odd number, the product will always terminate with five; and if multiplied by an even number, it will terminate with a cypher. Hence, every power of five necessarily terminates with five.

Five Churches, an episcopal town of Lower Hungary; subject to the house of Austria. It is 85 miles S. of Buda. Lat. 46. 5 N. Lon. 18. 13 E.

Five-cleft, in botany, quinquifidus. See Cleft.

Five-fold leaves, in botany, quinate; quintuple. In fives; growing by fives; or five and five together.

Five-lobed leaf, in botany, quinquelobed; quinquelobatum folium. See Lobate and Lobed.

Five-parted leaf, in botany, quinquepartitum folium. Five-parted corol. Corolla quinquepartita. See Partitum.

Five-leaved grass. See Pentaphyllum.

Five-toothed, in botany, quindentate. Applied to petal and capsule. See Dentate.

Five-valved, in botany, quinvalve. Applied to the capsule. See Valve.

Fives. *s.* 1. A kind of play with a bowl. 2. A disease of horses (*Shakspeare*).

FIUM, the capital of a province of the same name, in Egypt, Africa. The inhabitants are numerous, and they maintain a bishop here. Their principal trade is in flax, linen-cloth, mats, raisins, and figs. It is 70 miles S.W. of Cairo. Lat. 29. 2 N. Lon. 30. 49 E.

FIUME, or St. Viet, a seaport town of Istria, noted for wine and figs. Lat. 45. 40 N. Lon. 14. 46 E.

To FIX. *v. a.* (*fixer*, Fr. *fixus*, Lat.) 1. To make fast, firm, or stable (*Milton*). 2. To settle; to establish invariably (*Locke*). 3. To direct without variation (*Dryden*). 4. To deprive of volatility (*Locke*). 5. To pierce; to transfix (*Sandys*). 6. To withhold from motion.

To Fix. *v. n.* 1. To determine the resolution (*Locke*). 2. To rest; to cease to wander (*Waller*). 3. To lose volatility, so as to be malleable.

FIX-FAX, a name given by farriers to the cervical ligament of a horse, a tough, white, flat, and long substance, attached to the muscles of the neck, and stretching itself in the direction of the mane. In some counties it is called tax-wax.

FIXA'TION. *s.* (French.) 1. Stability; firmness; steadiness (*K. Charles*). 2. Residence in a certain place (*Raleigh*). 3. Forbearance of excursion (*Watts.*). 4. Want or destruction of volatility (*Bacon*). 5. Reduction from fluidity to firmness (*Glanville*).

FIXED AIR. See Carbonic acid.

Fixed bodies. Chemists give this name to those substances which cannot be caused to pass by a strong rarefaction from the liquid state to that of an elastic fluid.

Fixed stars are such as constantly retain the same apparent distance from each other in the concave surface of the heavens; and probably the same absolute position and distance with respect to each other. These are what we properly call stars, the others being spoken of under the peculiar denominations of Comet and Planet.

FI'XEDLY. *ad.* (from *fixed.*) 1. Certainly; firmly (*Locke*). 2. Stedfastly (*Burnet*).

FI'XEDNESS. *s.* (from *fixed.*) 1. Stability; firmness. 2. Want or loss of volatility (*Locke*). 3. Solidity, coherence of parts (*Bentley*). 4. Steadiness; settled opinion (*K. Charles*).

FIX'IDITY. *s.* Coherence of parts (*Boyle*).

FI'XITY. *s.* (*fixité*, French.) Coherence of parts, opposed to volatility (*Newton*).

FIXLMILLNER (Placidus), a celebrated German astronomer, was born at Achleitan in Hither Austria, in May 1721. He conceived an early attachment to the mathematics, and took so much pains in delineating mathematical figures, that his mother, out of derision, called him the almanac maker. He commenced his education at the convent of Kremsmunster, and completed it at Saltzburg. In 1737 he publicly took the vows in the convent at Kremsmunster; and about 1740 obtained the degree of doctor in theology. In 1745 he was appointed professor of canon law, an office which he held forty-eight years, but resigned it a short time before his death. In this department his knowledge was very extensive. He published in 1760 a theological work, called Reipublicæ Sacræ Origines Divinæ; but he acquired much more celebrity by his astronomical labours, both as an observer and a writer. In 1762 he was appointed astronomer at Kremsmunster, and applied with great zeal to the duties of this new station. He soon acquired a considerable rank among astronomical writers. In 1765 he published his Meridianus Speculæ Astron. Cremifanensis, in which he established the first elements of his observatory, and determined its longitude and latitude. In 1776 he published his second astronomical work, called Decennium Astronomicum, which contained the observations made by him at Kremsmunster from 1765 to 1775, and which is replete with important and useful information. His third work, on which he was employed towards the close of his life, and which was printed after his death, contains a valuable collection of observations made between the years 1776 and 1791, together with a great many calculations and treatises, which still add to his celebrity in this department. Besides these, many important articles written by him are to be found in the Journal des Savans; Bernoulli's Epistolary Correspondence; the French Ephemerides des Move; the Astronomical Almanac of Berlin; the Astronomical Ephemerides of Vienna; and the Memoirs of the Royal Academy of Sciences at Paris. Fixlmillner made a great number of excellent observations upon Mercury, which enabled Lalande to complete his accurate tables of that planet: he was the first who supported Bode's conjecture, that the star 34, in Taurus, observed by Flamsteed, and afterwards lost, was the planet Herschel. Fixlmillner died in August 1791, in his 71st year. To uncommon industry he united great penetration and deep reflection, as is proved by the great many excellent remarks and discoveries to be found in his works. It must here be added, that this able astronomer lived in a remote part of the country, at a distance from all literary helps, and from others who pursued the same studies; that is to say, from all those things which could animate his zeal; and yet he continued, till the last day of his life, a singular instance of perseverance and attachment to his favourite study.

FI'XTURE. *s.* (from *fix.*) 1. Position (*Shakspeare*). 2. Stable pressure (*Shakspeare*). 3. Firmness; stable state (*Shakspeare*).

FI'ZGIG. *s.* A kind of dart or harpoon with which seamen strike fish (*Sandys*).

FLA'BBY. *a.* (*flaccidus*, Lat.) Soft; not firm; easily shaking (*Arbuthnot*).

FLA'BILE. *a.* (*flabilis*, Latin.) Subject to be blown.

FLA'CCID. *a.* (*flaccidus*, Latin.) Weak; limber; not stiff; lax; not tense (*Holder*).

FLACCI'DITY. *s.* (from *flaccid.*) Laxity; limberness; want of tension (*Wiseman*).

FLACOURTIA, in botany, a genus of the class monoecia, order icosandria. Male; calyx five-parted; corolless; stamens very numerous. Female; calyx many-leaved; corolless; germ superior; styles from five to nine; berry many-celled. One species; a thorny shrub of Madagascar, with red pubescent petioles.

To FLAG. *v. n.* (*flaggeren*, Dutch.) 1. To hang loose without stiffness or tension. 2. To grow spiritless or dejected (*Swift*). 3. To grow feeble; to lose vigour (*B. Jonson*).

To Flag. *v. a.* 1. To let fall into feebleness; to suffer to droop (*Prior*). 2. To lay with broad stone (*Sandys*).

Flag. *s.* (from the verb.) 1. A water plant with a bladed leaf and yellow flower (*Sandys*). 2. The colours or ensign of a ship or land forces (*Temple*). 3. A species of stone used for smooth pavements (*flaçhe*, old French.) (*Woodward*).

Flag, a general name for colours, standards, ancients, banners, ensigns, &c. which are frequently confounded with each other.

The fashion of pointed, or triangular flags, as now used, came from the Mahometan Arabs, or Saracens, upon their seizing of Spain, before which time all the ensigns of war were stretched or extended on cross pieces of wood, like the banners of a church. The pirates of Algiers, and throughout the coasts of Barbary, bear an hexagonal flag.

Flag is more particularly used at sea, for the colours, ancients, standards, &c. borne on the top of the masts of vessels, to notify the person who commands the ship, of what nation it is, and whether it is equipped for war or trade.

The admiral in chief carries his flag on the main-top; and the vice-admiral on the fore-top; and the rear-admiral on the mizen-top.

When a council of war is to be held at sea, if it be on board the admiral, they hang a flag in the main-shrouds; if in the vice-admiral, in the fore-shrouds; and if in the rear-admiral, in the mizen-shrouds.

Beside the national flag, merchant-ships frequently bear lesser flags on their mizen-mast, with the arms of the city where the master ordinarily resides: and on the fore-mast, with the arms of the place where the person who freights them lives.

To lower, or strike the flag, is to pull it down upon the cap, or to take it in, out of respect or submission, due from all ships or fleets inferior, to those any way justly their superiors. To lower or strike the flag in an engagement is a sign of yielding.

The way of leading a ship in triumph is to tie the flags to the shrouds or the gallery, in the hind part of the ship, and let them hang down towards the water, and to tow the vessels by the stern.

To heave out the flag, is to put out, or put abroad, the flag.

To hang out the white flag, is to ask quarter; or it shews when a vessel is arrived on a coast, that it has no hostile intention, but comes to trade, or the like. The red flag is a sign of defiance and battle.

Flag, or Flag-flower. See Iris.

Flag (Sweet-scented). See Acorus.

Flag (Corn). See Gladiolus.

Flag-officers, those who command the several squadrons of a fleet, such as the admirals, vice-admirals, and rear-admirals.

The flag-officers in our pay are the admiral, vice-admiral, and rear-admiral, of the white, red, and blue. See the article Admiral.

Flag-ship, a ship commanded by a general or flag-officer, who has a right to carry a flag, in contradistinction to the secondary vessels under its command.

Flag-staves, are staves set on the heads of the top-gallant-masts, serving to let fly or unfurl the flag.

Flags, in falconry, are the feathers in a hawk's wing, near the principal ones.

Flag is used for sedge, a kind of rush; and for the upper part of turf, pared off to burn.

FLAGELLA'TION. *s.* (from *flagello*, Latin.) The use of the scourge (*Garth*).

FLAGELLANTES, a sect of wild fanatics who chastised and disciplined themselves with whips in public. The sect of the Flagellantes had its rise in Italy in the year 1260; its author was one Rainier, a hermit; and it was propagated from hence through almost all the countries of Europe. It was in all probability no more than the effect of an indiscreet zeal. A great number of persons of all ages and sexes made processions, walking two by two with their shoulders bare, which they whipped till the blood ran down, in order to obtain mercy from God, and appease his indignation against the wickedness of the age. They were then called the *devout*; and having established a superior, he was called *the general of the devotion*. Though the primitive Flagellantes were exemplary in point of morals, yet they were joined by a turbulent rabble, who were infected with the most ridiculous and impious opinions; so that the emperors and pontiffs thought proper to put an end to this religious phrensy, by declaring all devout whipping contrary to the divine law, and prejudicial to the soul's eternal interest.

FLAGELLA'RIA, in botany, a genus of the class hexandria, order trigynia. Calyx six-parted; corolless; berry superior, one-seeded.

Two species; natives of India: one a creeping herbaceous plant, the other a shrub with flowers in a terminal panicle.

FLAGE'LLIFORM. Whip-like. In botany. See RUNNER. Hence a sort of cactus has the name of flagelliformis, because it resembles the lash of a whip, flagellum.

FLAGEOLET, a small pipe or flute, the notes of which are exceedingly clear and shrill. It is generally made of box or other hard wood, though sometimes of ivory, and has six holes for the regulation of its sounds, besides those at the bottom and mouth-piece, and that behind the neck. (*Busby*.)

FLA'GGINESS. *s.* (from *flaggy*.) Laxity; limberness; want of tension.

FLA'GGY. *a.* (from *flag*.) 1. Weak; lax; limber; not tense (*Dryden*). 2. Weak in taste; insipid (*Bacon*).

FLAGI'TIOUS. *a.* (from *flagitius*, Latin.) 1. Wicked; villanous; atrocious (*Roscom*.). 2. Guilty of crimes (*Pope*).

FLAGI'TIOUSNESS. *s.* (from *flagitious*.) Wickedness; villany.

FLA'GON. *s.* (*flaçon*, French.) A vessel of drink with a narrow mouth (*Roscommon*).

FLA'GRANCY. *s.* (*flagrantia*, Lat.) Burning; heat; fire (*Bacon*).

FLA'GRANT. *a.* (*flagrans*, Lat.) 1. Ardent; burning; eager (*Hooker*). 2. Glowing; flushed (*Pope*). 3. Red; imprinted red (*Pri.*) 4. Notorious; flaming into notice (*Smith*).

FLAGRA'TION. *s.* (*flagro*, Lat.) Burning.

FLAIL, an instrument for thrashing corn. A flail consists of the following parts: 1. The hand-staff, or piece held in the thresher's hand. 2. The swiple, or that part which strikes out the corn. 3. The caplins, or strong double leathers, made fast to the tops of the hand-staff and swiple. 4. The middle-band, being the leather thong, or fish skin, that ties the caplins together.

FLAIR, in the sea language. When a ship is housed in near the water, so that the work above hangs over too much, it is said to flair over. This makes the ship more roomy aloft, for the men to use their arms.

FLAKE. *s.* (*floccus*, Latin.) 1. Any thing that appears loosely put together, like a flock of wool (*Grew*). 2. A stratum; layer; film; lamina (*Sandys*).

To FLAKE. *v. a.* (from the noun.) To form in flakes, or bodies loosely connected (*Pope*).

To FLAKE. *v. n.* To break into laminæ; to part in loose bodies.

FLAKE, in the cod-fishery, a sort of scaffold or platform, made of hurdles, and supported by stanchions, and used for drying codfish in Newfoundland. These flakes are usually placed near the shores of fishing-harbours.

FLAKE, in gardening, a name given by the florists to a sort of carnations, which are of two colours only, and have very large stripes, all of them going quite through the leaves.

FLA'KY. *a.* (from *flake*.) 1. Loosely hanging together (*Blackmore*). 2. Lying in layers or strata; broken into laminæ.

FLAM. *s.* (a cant word.) A falsehood; a lie; an illusory pretext (*Hudibras*).

To FLAM. *v. a.* (from the noun.) To deceive with a lie (*South*).

FLAMBEAU, a kind of large taper, made of hempen wicks, by pouring melted wax on their top, and letting it run down to the bottom. This done, they lay them to dry; after which they roll them on a table, and join four of them together by means of a red-hot iron; and then pour on more wax, till the flambeau is brought to the size required. Flambeaus are of different lengths, and made either of white or yellow wax. They serve to give light in the streets at night, or on occasion of illuminations.

FLAMBOROUGH HEAD, a lofty promontory in Yorkshire, whose snow-white cliffs are seen far out at sea. Its rocks afford shelter to innumerable multitudes of sea-fowls. Lat. 54. 9 N. Lon. 0. 4 E. This was the Fleamburg of the Saxons; so called, as some think, from the lights made on it to direct the landing of Ina, who in 547 joined his countrymen in these parts with a large reinforcement from Germany, and founded the kingdom of Northumberland.

FLAME. *s.* (*flamma*, Latin.) 1. Light emitted from fire (*Newton*). 2. Fire (*Cowley*). 3. Ardour of temper or imagination; brightness of fancy; vigour of thought (*Waller*). 4. Ardour of inclination (*Pope*). 5. Passion of love (*Cowley*).

To FLAME. *v. n.* (from the noun.) 1. To shine as fire; to burn with emission of light (*Milton*). 2. To shine like flame (*Prior*). 3. To break out in violence of passion.

FLAME, in the first of the above senses, has been conjectured by Newton to be a vapour red-hot. This we think imperfect. We should rather say, that flame is an instance of combustion, whose colour will be determined by the degree of decomposition which takes place. If it be very imperfect, the most refrangible rays only will appear. If it be very perfect, all the rays will appear, and the flame will be brilliant in proportion to this perfection. There are flames, however, which consist of burning particles, whose rays have partly escaped before they ascended in the form of vapour. Such would be the flame of a red-hot coal, if exposed to such a heat as would gradually disperse it into vapour. When the fire is very low under the furnace of an iron-foundery, at the upper orifice of the chimney a red flame of this kind may be seen, which is different from the flame that appears immediately after fresh coals have been thrown on the fire; for, in consequence of adding such a supply to the burning fuel, a vast column of smoke ascends, and forms a medium so thick as to absorb most of the rays excepting the red. On this subject the reader may advantageously peruse the Rev. G. C. Morgan's Observations and Experiments on the Light of Bodies in a State of Combustion. Phil. Trans. vol. 75, or New Abridg. vol. 15. p. 668.

When oxygen gas is decomposed slowly,

the heat is imperceptible, because the caloric is dissipated as soon as generated. When the decomposition goes on faster, the bodies concerned become sensibly warm. A quicker decomposition of the gas heats the bodies so as to render them red hot, which state is called ignition: and when the process is attended with the production of certain fluids, as hydrogen, &c. and the decomposition of oxygen air affords a sufficient developement of caloric, then the fluids themselves are ignited, and decomposed, which constitutes flame, and is thence termed inflammation. When a candle is first lighted, which must be done by the application of actual flame, a degree of heat is given to the wick sufficient to destroy the affinity of its constituent parts: some of the tallow is instantly melted, volatilized, and decomposed, its hydrogen takes fire, and the candle melts. As this is destroyed by combustion, another portion melts, rises and supplies its place, and undergoes a like decomposition. In this way combustion is maintained in a candle. The most brilliant flame is exhibited in oxygen gas, and in this flames of different colours may be produced: thus a mixture of nitrate of strontia and charcoal powder, previously ignited, burns with a rose-coloured flame: one part of boracic acid, and three of charcoal mixed, will burn green: one part of nitrate of barytes and four of charcoal powder burn with a yellow flame; equal parts of nitrate of lime and charcoal powder burn orange red.

As the artificial light of lamps and candles is afforded by the flame they exhibit, it seems a matter of considerable importance to society, to ascertain how the most luminous flame may be produced with the least consumption of combustible matter. There does not appear to be any danger of error in concluding, that the light emitted will be greatest when the matter is completely consumed in the shortest time. It is, therefore, necessary, that a stream of volatilized combustible matter of a proper figure, at a very elevated temperature, should pass into the atmosphere with a certain determinate velocity. If the figure of this stream should not be duly proportioned; that is to say, if it be too thick, its internal parts will not be completely burned for want of contact with the air. If its temperature be below that of ignition, it will not burn when it comes into the open air. And there is a certain velocity at which the quantity of atmospherical air which comes in contact with the vapour will be neither too great nor too small; for too much air will diminish the temperature of the stream of combustible matter so much as very considerably to impede the desired effect, and too little will render the combustion languid.

We have an example of a flame too large in the mouths of the chimneys of furnaces, where the luminous part is merely superficial, or of the thickness of about an inch or two, according to circumstances, and the internal part, though hot, will not set fire to paper passed into it through an iron tube: the same defect of air preventing the combustion of the paper, as prevented the interior fluid itself from burning. And in the lamp of Argand we see the advantage of an internal current of air, which renders the combustion perfect by the application of air on both sides of a thin flame. So likewise a small flame is whiter and more luminous than a larger; and a short snuff of a candle giving out less combustible matter in proportion to the circumambient air, the quantity of light becomes increased to eight or ten times what a long snuff would have afforded.

FLAMECO'LOURED. *a* (*flame* and *colour.*) Of a bright yellow colour (*Peacham*).

FLA'MEN. *s.* (Latin.) A priest; one that officiates in solemn offices (*Pope*).

Flamen, in Roman antiquity, the name of an order of priests, instituted by Romulus or Numa; authors not being agreed on this head. They were originally only three, viz. the Flamen Dialis, Flamen Martialis, and Flamen Quirinalis.

The wife of the Flamen Dialis was called *Flaminica*, and wore a flame-coloured habit, on which was painted a thunderbolt, and above her head-dress she had green oak boughs, to indicate that she belonged to Jupiter the thunderer, to whom the oak was sacred. The Flamines wore each of them a hat or cap called *Flammeum* or *Apex*.

FLAMINGO, in ornithology. See Phœnicopterus.

FLAMINIA VIA, a celebrated road which led from Rome to Ariminum and Aquileia. It received its name from

FLAMINIUS (C.), a Roman consul of a turbulent disposition, who was drawn into a battle near the lake of Thrasymenus, by the artifice of Annibal. He was killed in the engagement, with an immense number of Romans, B. C. 217. *Polyb. Liv.* &c.

Flaminius (T. Q.), or Flamininus, a celebrated Roman raised to the consulship, A. U. C. 554, was trained in the art of war against Annibal. He was sent against Philip, king of Macedonia, and in his expedition he met with uncommon success. The Greeks declared themselves his supporters, and he totally defeated Philip on the confines of Epirus, and made all Locris, Phocis, and Thessaly, tributary to the Roman power. He proclaimed all Greece independent at the Isthmian games. This celebrated action procured him the name of father and deliverer of Greece. He was afterwards sent ambassador to Prussias, king of Bythinia, where, by his prudence and artifice, he soon caused Annibal, who had taken refuge at his court, to dispatch himself. Flaminius was found dead in his bed, after he had imitated with success the virtues of his model Scipio. (*Plut.*)—Lucius, the brother of the preceding, signalized himself in the wars of Greece.—Calp. Flamma, a tribune, who at the head of 300 men saved the Roman army in Sicily, B. C. 258, by engaging the Carthaginians, and cutting them to pieces.

FLAMMABI'LITY. *s.* (*flamma*, Latin.) The quality of admitting to be set on fire (*Brown*).

FLAMMA'TION. *s.* (*flammatio*, Latin.) The act of setting on flame (*Brown*).

FLA'MMEOUS. *a.* (*flammeus*, Lat.) Consisting of flame; resembling flame (*Brown*).

FLAMMI'FEROUS. *a.* (*flammifer*, Lat.) Bringing flame.

FLAMMI'VOMOUS. *a.* (*flamma* and *vomo*, Lat.) Vomiting out flame.

FLAMMULA. (*flammula*, dim. of *flamma*, a fire, named from the burning pungency of its taste.) Small water crow-foot, or spearwort. The roots and leaves of this common plant, ranunculus flammula; foliis ovatis-lanceolatis, petiolatis, caule declinato of Linnéus, taste very acrid and hot, and, when taken in a small quantity, produce vomiting, spasms of the stomach, and delirium. Applied externally, they vesicate the skin. The best antidote after clearing the stomach, is cold-water acidulated with lemon-juice, and then mucilaginous drinks. See RANUNCULUS.

FLAMMULA JOVIS. (*flammula jovis*, so called from the burning pungency of its taste.) Upright virgin's bower. Clematis recta; foliis pinnatis, foliolis ovato lanceolatis integerrimis, caule erecto, floribus pentapetalis tetrapetalisque of Linnéus, of the class polyandria, and order of polygynia. More praises have been bestowed upon the virtue which the leaves of this plant are said to possess, when exhibited internally as an antivenereal by foreign physicians, than its trials in this country can justify. The powdered leaves are sometimes applied externally to ulcers as an escharotic. See CLEMATIS.

FLAMSTED, a town of Hertfordshire in England, five miles from St. Alban's and Dunstable, stands on the river Verlam, and was of old called Verlamstede.

FLAMSTEED (John), a celebrated English astronomer, born at Derby in 1646, and educated at the grammar-school of that town. When very young he discovered a great turn for mathematical learning, and in 1666 he calculated an eclipse of the sun which was about to happen. This being shewn to a gentleman of genius in that line, he greatly encouraged young Flamsteed in his studies, and lent him several books on astronomy. He made so good an use of these, that in 1669 he sent to the royal society calculations of some remarkable eclipses of the fixed stars by the moon, for which he received the thanks of that learned body. The year following he went to London, where he was greatly caressed by the most learned mathematicians of the time. From thence he went to Cambridge, and entered himself of Jesus college. One of his best friends was sir Jonas Moore, who introduced him to the king, and most of the nobility at court. In 1674 that gentleman procured for him the place of astronomer royal, and the same year he entered into holy orders. In 1675 the foundation stone of the royal observatory was laid, and then Mr. Flamsteed removed with all his apparatus to the queen's house at Greenwich, where he resided till his death in 1719. All the church preferment he ever received was the living of Burstow, in Surrey. In 1725 appeared his great work, entitled, Historia Celestis Britannica, in 3 vols. folio. In the Philosophical Transactions are many of his papers, and in sir Jonas Moore's System of Mathematics is a tract by Mr. Flamsteed, on the Doctrine of the Sphere. Dr. Wotton, in his Reflections upon Ancient and Modern Learning, styles our author one of the most accurate observers of the planets and stars, and says he calculated tables of the eclipses of the several satellites, which proved very useful to the astronomers. And Mr. Molyneux, in his Dioptrica Nova, gives him a high character; and, in the admonition to the reader prefixed to the work, observes, that the geometrical method of calculating a ray's progress is quite new, and never before published; and for the first hint of it, says he, I must acknowledge myself obliged to my worthy friend Mr. Flamsteed. He wrote several small tracts, and had many papers inserted in the Philosophical Transactions, viz. several in almost every volume, from the 4th to the 29th, too numerous to be mentioned in this place.

FLA'MY. *a.* (from *flame*.) 1. Inflamed; burning; blazing (*Sidney*). 2. Having the nature of flame (*Bacon*).

FLANDERS, a country of the Netherlands, divided into Dutch, Austrian, and French Flanders; the last now included in the department of the North. It is 60 miles long, and 50 broad; bounded on the north by the German ocean and the United Provinces; on the east by Brabant; on the south by Hainault and Artois; and on the W. by Artois and the German ocean. It is a level country, pretty fertile. The manufactures are fine linen, lace, and tapestry.

FLANEL, or **FLANNEL,** a kind of slight, loose, woollen stuff, composed of a woof and warp, and woven on a loom with two treadles, after the manner of bays. Dr. Black assigns as a reason why flanel and other substances of the kind keep our bodies warm, that they compose a rare and spongy mass, the fibres of which touch each other so slightly, that the heat moves slowly through the interstices, which being filled only with air, and that in a stagnant state, gives little assistance in conducting the heat. Count Rumford, however, has inquired farther into the matter, and finds that there is a relation betwixt the power which the substances usually worn as clothing have of absorbing moisture, and that of keeping our bodies warm. Having provided a quantity of each of those substances, mentioned below, he exposed them, spread out upon China plates, for the space of twenty-four hours to the warm and dry air of a room, which had been heated by a German stove for several months, and during the last six hours had raised the thermometer to 85° of Fahrenheit: after which he weighed equal quantities of the different substances with a very accurate balance. They were then spread out upon a China plate, and removed into a very large uninhabited room upon the second floor, where they were exposed forty-eight hours upon a table placed in the middle of the room, the air of which was at 45° of Fahrenheit. At the end of this space they were weighed, and then removed into a damp cellar, and placed on a table in the middle of the vault, where the air was at the temperature of 45°, and which by the hygrometer seemed to be fully saturated with moisture. In this situation they were suffered to remain three days and three nights, the vault being all the time hung round with wet linen cloths, to render the air as completely damp as possible. At the end of three days they were weighed, and the weights at the different times were found as in the following table.

	Weight after being dried in the hot room.	Weight after coming out of the cold room.	Weight after remaining 72 hours in the vault.
Sheep's wool - -	1000 parts	1084	1163
Beaver's fur - -		1072	1125
The fur of a Russian hare - - -		1065	1115
Eider down - -		1067	1112
Silk: Row single thread -		1057	1107
Silk: Ravellings of white taffety		1054	1103
Linen: Fine lint -		1046	1102
Linen: Ravellings of fine linen		1044	1082
Cotton wool - -		1043	1089
Ravellings of silver lace		1090	1000

On these experiments our author observes, that though linen, from the apparent ease with which it receives dampness from the atmosphere, seems to have a much greater attraction for water than any other; yet it would appear, from what is related above, that those bodies which receive water in its inelastic form with the greatest ease, or are most easily wet, are not those which in all cases attract the moisture of the atmosphere with the greatest avidity. "Perhaps (says he), the apparent dampness of linen to the touch arises more from the ease with which that substance parts with the water it contains, than from the quantity of water it actually holds: in the same manner as a body appears hot to the touch, in consequence of its parting freely with its heat; while another body, which is really at the same temperature, but which withholds its heat with greater obstinacy, affects the sense of feeling much less violently. It is well known that woollen clothes, such as flanels, &c. worn next the skin, greatly promote insensible perspiration. May not this arise principally from the strong attraction which subsists between wool and the watery vapour which is continually issuing from the human body? That it does not depend entirely on the warmth of that covering, is clear; for the same degree of warmth, produced by wearing more clothing of a different kind, does not produce the same effect. The perspiration of the human body being absorbed by a covering of flanel, it is immediately distributed through the whole thickness of that substance, and by that means exposed, by a very large surface, to be carried off by the atmosphere; and the loss of this watery vapour, which the flanel sustains on the one side by evaporation, being immediately restored from the other, in consequence of the strong attraction between the flanel and this vapour, the pores of the skin are disencumbered, and they are continually surrounded by a dry and salubrious atmosphere."

Our author expresses his surprise, that the custom of wearing flanel next the skin should not have prevailed more universally. He is confident it would prevent a number of diseases; and he thinks there is no greater luxury than the comfortable sensation which arises from wearing it, especially after one is a little accustomed to it. "It is a mistaken notion (says he), that it is too warm a clothing for summer. I have worn it in the hottest climates, and at all seasons of the year; and never found the least inconvenience from it. It is the warm bath of perspiration confined by a linen shirt, wet with sweat, which renders the summer heats of southern climates so insupportable; but flanel promotes perspiration, and favours its evaporation; and evaporation, as is well known, produces positive cold."

It has been observed that new flanel, after some time wearing, acquires the property of shining in the dark, but loses it on being washed. See Philos. Trans. No. 483. § 7.

FLANK. *s.* (*flanc*, French.) 1. That part of the side of a quadruped near the hinder thigh (*Peacham*). 2. (In men.) The latter part of the lower belly (*Pope*). 3. The side of any army or fleet (*Hayward*).

To **FLANK.** *v. a.* 1. To attack the side of a battalion or fleet. 2. To be posted so as to overlook or command any pass on the side (*Dry.*). 3. To secure on the side (*Dryden*).

FLANK, in war, is used by way of analogy for the side of a battalion, army, &c. in contradistinction to the front and rear. To attack the enemy in flank, is to discover and fire upon them on one side. See FILE.

FLANK, in fortification, is a line drawn from the extremity of the face towards the inside of the work. Or, flank is that part of a bastion which reaches from the curtain to the face, and defends the opposite face, the flank, and the curtain. See FORTIFICATION.

FLANKS, in veterinary language, the sides of a horse. In a strict sense, the flanks are the extremities of the belly, where the ribs are wanting, and below the loins. The distance between the last rib and haunch-bone, which is properly the flank, should be short: this is termed *well coupled.* Such horses are most hardy, it is said, and will endure labour longest. A horse is said to have no flank, if the last of the short ribs be at a considerable distance from the haunch-bone; although such horses may at the time have very good bodies, yet, when they are hard laboured, they will lose them. A horse also is said to have no flank when his ribs are too much straitened in their compass, which is easily perceived by comparing their height with that of the haunch-bones; for they ought to be as high and equally raised up as the latter, or but very little less, when the horse is in good case.

A horse is likewise said to have scanty flanks, to be gaunt-bellied, and thin-gutted, when his flank turns up like a greyhound's, and his ribs are flat, narrow, and short. A well-flanked horse is one that has wide and well-made ribs, with a good body.

FLA'NKER. *s.* (from *flank.*) A fortification jutting out so as to command the side of a body marching to the assault (*Knolles*).

To FLA'NKER. *v. a.* (*flanquer*, French.) To defend by lateral fortifications.

FLA'NNEL. *s.* (*gwlanen*, Welsh.) A soft nappy stuff or wool (*Shakspeare*).

FLAP. *s.* (læppe, Saxon.) 1. Any-thing that hangs broad and loose (*Brown*). 2. The motion of any thing broad and loose. 3. A disease in horses (*Farrier's Dict.*)

To FLAP. *v. a.* (from the noun.) 1. To beat with a flap, as flies are beaten. 2. To move with a flap or noise (*Tickel*).

To FLAP. *v. n.* 1. To play the wings with noise (*L'Estrange*). 2. To fall with flaps or broad parts depending (*Gay*).

FLA'PDRAGON. *s.* A play in which they catch raisins out of burning brandy, and eat them. 2. The thing eaten at flapdragon (*Shakspeare*).

To FLA'PDRAGON. *v. a.* (from the noun.) To swallow; to devour (*Shakspeare*).

FLAPE'ARED. *a.* (*flap* and *ear.*) Having loose and broad ears (*Shakspeare*).

To FLARE. *v. n.* (from *flederen*, Dutch.) 1. To flutter with a splendid show (*Shaks.*). 2. To glitter with transient lustre (*Herbert*). 3. To glitter offensively (*Milton*). 4. To be in too much light (*Prior*).

FLASH. *s.* (φλοξ, *Minshew.*) 1. A sudden, quick, transitory blaze (*Roscommon*). 2. Sudden burst of wit or merriment (*Rogers*). 3. A short transient state (*Bacon*). 4. A body of water driven by violence.

To FLASH. *v. n.* 1. To glitter with a quick and transient flame. 2. To burst out into any kind of violence (*Shakspeare*). 3. To break out into wit, merriment, or bright thought (*Felton*).

To FLASH. *v. a.* To strike up large bodies of water from the surface (*Carew*).

FLA'SHER. *s.* (from *flash.*) A man of more appearance of wit than reality.

FLA'SHILY. *ad.* (from *flashy.*) With empty show; without real power of wit.

FLA'SHY. *a.* (from *flash.*) 1. Empty; not solid; showy without substance (*Digby*). 2. Insipid; without force or spirit (*Bacon*).

FLASK. *s.* (*flasque*, French.) 1. A bottle; a vessel (*King*). 2. A powder iron (*Shakspeare*).

FLA'SKET. *s.* (from *flask.*) A vessel in which viands are served (*Pope*).

FLAT. *a.* (*plat*, French.) 1. Horizontally level without inclination (*Add.*). 2. Smooth; without protuberances (*Bacon*). 3. Not elevated; fallen (*Milton*). 4. Level with the ground (*South*). 5. Lying prostrate; lying along (*Daniel*). 6. (In painting.) Wanting relief; wanting prominence of the figures. 7. Tasteless; insipid; dead (*Philips*). 8. Dull; unanimated; frigid (*Bacon*). 9. Depressed; spiritless; dejected (*Milton*). 10. Unpleasing; tasteless (*Atterbury*). 11. Peremptory; absolute; downright (*Spenser*). 12. Not shrill; not sharp in sound (*Bacon*).

FLAT LEAF, in botany. Folium planum. Having an even surface; in opposition to channelled, grooved, &c. When applied to succulent leaves, it has both surfaces parallel, neither convex nor concave, in opposition to gibbous.

FLAT. *s.* 1. A level; an extended plane (*Wotton*). 2. Even ground; not mountainous (*Milton*). 3. A smooth low ground exposed to inundations (*Shakspeare*). 4. Shallow; strand; place in the sea where the water is not deep (*Raleigh*). 5. The broad side of a blade (*Dryden*). 6. Depression of thought or language (*Dryden*). 7. A surface without relief, or prominences (*Bentley*).

FLAT, a kind of additional or half note, contrived together with sharps to correct the defects in musical instruments. A flat implies that the note which it stands against is to be played or sung half a note lower than it would be without such flat. Thus E ♭, or E flat, signifies a semitone below E natural, and when placed at the beginning of a line or space, shews that all the notes on that line or space are to be sung or played half a note lower throughout the whole piece, unless it be contradicted by a natural.

The whole octave in the diatonic scale is divided into twelve degrees, each being a semitone; and as the distance between each two nominals of the scale, except between B and C and between E and F, is equal to a tone; flats and sharps were found necessary in this case also, to denote the semitonic intervals.

FLAT, or MINOR, KEY, in music, that key, the third, sixth, and seventh, of which are minor. See KEY.

FLAT-THIRD, in music, the third minor.

To FLAT. *v. a.* (from the noun.) 1. To level; to depress; to make broad and smooth (*Creech*). 2. To make vapid (*Bacon*).

To FLAT. *v. n.* 1. To grow flat: opposed to *swell* (*Temple*). 2. To render unanimated or evanid (*K. Charles*).

FLA'TLONG. *ad.* (*flat* and *long.*) With the flat downward: not edgewise (*Shaksp.*).

FLA'TLY. *ad.* (from *flat.*) 1. Horizontally; without inclination. 2. Without prominence or elevation. 2. Without spirit; dully; frigidly. 4. Peremptorily; downright (*Daniel*).

FLA'TNESS. *s.* (from *flat.*) 1. Evenness; level extension. 2. Want of relief or prominence (*Addison*). 3. Deadness; insipidity; vapidness (*Mortimer*). 4. Dejection of fortune (*Shakspeare*). 5. Dejection of mind; want of life (*Collier*). 6. Dulness; insipidity; frigidity (*Pope*). 7. The contrary to shrillness or acuteness of sound (*Bacon*).

FLATTED. Compressus. In botany,

Better expressed by Compressed, which see.

To FLA'TTEN. *v. a.* (from *flat.*) 1. To make even or level, without prominence or elevation. 2. To beat down to the ground (*Mortimer*). 3. To make vapid. 4. To deject; to depress; to dispirit.

To Fla'tten. *v. n.* 1. To become even or level. 2. To grow dull and insipid (*L'Est.*).

FLA'TTER. *s.* (from *flat.*) The workman or instrument by which bodies are flattened.

To Fla'tter. *v. a.* (*flatter*, French.) 1. To sooth with praises; to please with blandishments (*Shakspeare*). 2. To praise falsely (*Young*). 3. To please; to sooth (*Dryden*). 4. To raise false hopes (*Milton*).

FLA'TTERER. *s.* (from *flatter.*) One who flatters; a fawner; a wheedler (*Swift*).

FLA'TTERY. *s.* (*flaterie*, French.) False praise; artful obsequiousness; adulation (*Young*).

Some persons distinguish between compliment and flattery. He who *compliments* is said to deliver truths relative to the characters, the virtues, and excellencies of others, for the sake of gratifying them by shewing them that he knows their value: he who *flatters*, deals in exaggerations and falsehoods for the sake of pleasing those of whom he thinks meanly enough to imagine they will be gratified by praise which is not their due. True delicacy of mind makes a man shrink even from being complimented, lest he should thereby be brought to think of himself more highly than he ought: and true delicacy of sentiment will make a man cautious how he deals even in compliments, lest by blunting his perception through long habit, he should unawares pass the barrier, and glide from pleasing truths to untruths meant to please, that is, degenerate from compliment into flattery.

FLA'TTISH. *a.* (from *flat*.) Somewhat flat; approaching to flatness (*Woodward*).

FLA'TULENCY. *s.* (from *flatulent.*) 1. Windiness; fulness of wind (*Arbuthnot*). 2. Emptiness; vanity; levity; airiness (*Glanv.*).

FLA'TULENT. *a.* (*flatulentus*, Latin.) 1. Turgid with air; windy (*Arbuthnot*). 2. Empty; vain; big without substance or reality; puffy.

FLATUO'SITY. *s.* (*flatuosité*, French.) Windiness; fulness of air (*Bacon*).

FLA'TUOUS. *a.* (from *flatus*, Latin.) Windy; full of wind (*Bacon*).

FLA'TUS. *s.* (Latin.) Wind gathered in any cavities of the body (*Quincy*).

FLA'TWISE. *ad.* With the flat downward; not the edge (*Woodward*).

FLAVEL (John), an eminent nonconformist minister, was educated at University college in Oxford; and became minister of Deptford, and afterwards of Dartmouth in Devonshire, where he resided the greatest part of his life, and was admired for his preaching. Though he was generally respected at Dartmouth, yet in 1685 several of the aldermen of that town, attended by the rabble, carried about a ridiculous effigy of him, to which were affixed the Bill of Exclusion and the Covenant. Upon this occasion, he thought it prudent to withdraw from the town; not knowing what treatment he might meet with from a riotous mob, headed by magistrates who were themselves among the lowest of mankind. Part of his Diary, printed with his Remains, must give the reader an high idea of his piety. He died in 1691, aged 61; and after his death, his works, which consisted of many pieces of practical divinity, were printed in two volumes folio. Among these the most famous are his Navigation Spiritualized, or a New Compass for Seamen, consisting of 32 points of pleasant observations and serious reflections, of which there have been several editions in 8vo.; and his Husbandry Spiritualized, &c. with occasional meditations upon beasts, birds, trees, flowers, rivers, and several other objects, of which also there have been many editions in octavo.

FLAVIGINI, a town of France, in the department of Cote d'Or, with a late celebrated Benedictine abbey. Lat. 47. 26 N. Lon. 4. 37 E.

To FLAUNT. *v. n.* 1. To make a fluttering show in apparel (*Milton*). 2. To be hung with something loose and flying (*Pope*).

Flaunt. *s.* Any thing loose and airy (*Shakspeare*).

FLA'VOUR. *s.* 1. Power of pleasing the taste (*Addison*). 2. Sweetness to the smell; odour; fragrance (*Dryden*).

FLA'VOROUS. *a.* (from *flavour.*) 1. Delightful to the palate (*Dryden*). 2. Fragrant; odorous.

FLAUTINO, in music, an octave flute, or one whose pitch is an octave above that of the German flute.

FLAUTO, in music, a flute. Sometimes this term is used to denote the part which is to be played upon a flute.

FLAW. *s.* (φλαω, to break.) 1. A crack or breach in any thing (*Boyle*). 2. A fault; defect (*Dryden*). 3. A sudden gust; a violent blast (*Chapman*). 4. A tumult; a tempestuous uproar (*Dryden*). 5. A sudden commotion of mind (*Shakspeare*).

To Flaw. *v. a.* (from the noun.) 1. To break; to crack; to damage with fissure (*Boyle*). 2. To break; to violate: not used (*Shakspeare*).

FLA'WLESS. *a.* (from *flaw.*) Without cracks; without defects (*Boyle*).

FLAWN. *s.* (ꝼlena, Saxon.) A sort of custard; a pie baked in a dish (*Tusser*).

To FLA'WTER. *v. n.* To scrape or pare a skin.

FLA'WY. *a.* (from *flaw.*) Full of flaws.

FLAX. *s.* (ꝼleax, ꝼlex, Saxon.) 1. The plant of which the finest thread is made. (See Linum.) 2. The fibres of flax cleansed and combed for the spinner (*Dryden*).

Flax (Toad). See Anterrhinum.

Flax-leaved daphne. See Thymelæa.

Flax (Purging). See Linum catharticum.

Flax (Spurge). See Thymelæa.

Flax, in agriculture and commerce, is an excellent commodity, and the cultivation of it a good piece of husbandry. It will thrive in any sound land, but that which has lain long fallow is best; which being well ploughed, and laid flat and even, the seeds must be sown in a warm season, about the middle or end of March, or at farthest the beginning of April; and if a wet season happen, weeding will be necessary. The best seed is that brought from the east country, which though dear, yet easily repays the charge: this will last two or three crops, when it is adviseable to renew the seeds again. Of the best seed, two bushels may serve for an acre; but more must be allowed of home seed, because it grows smaller. When grown up, it ought not to be gathered before it be fully ripe; for if pulled before the blossom falls, it hackles away almost to nothing; and, though in appearance very fine, yet it has no substance, and the yarn spun of it is weak and ouzy: it not only wastes in the washing, but the linen made of it grows extremely thin in the bleaching. The pluckers should be nimble, tie it up in handfuls, set them up till perfectly dry, and then house them. Flax pulled in the bloom proves whiter and stronger than if left standing till the seed is ripe; but then the seed will be lost. See Husbandry.

Flax (Dressing of). When flax has been watered, and twice swingled, it is then to be heckled in a much finer heckle than that used for hemp. Hold the strike of flax stiff in your hand, and break it very well upon the coarse heckle; saving the hurds to make harder cloth of. This done, the strike is to be passed through a finer heckle, and the hurds coming from thence saved form middling cloth, and the tare itself for the best linen.

But to dress flax for the finest use of all, after being handled as before, and laying three strikes together, plat them in a plat of three rows, as hard and close together as you can; joining one to the end of another, till you have platted as much as you think convenient: then begin another plat, and add as many several ones as you think will make a roll; afterwards wreathing them hard together, make up the roll; which done, put as many as you judge convenient into a hemp-trough, and beat them soundly, rather more than less than you do hemp. Next open and unplat them, dividing all the strikes very carefully from each other; and so strike it through the finest heckle of all, whereof there are three sorts. Great care must be taken to do this gently and lightly, lest what is heckled from thence should run to knots; for if preserved soft like cotton, it will make very good linen, each pound running at least two yards and a half. The tear itself, or finest flax, will make a strong and very fine holland, running at least five yards in the pound.

On the subject of dressing flax, we refer the reader to some observations published in the Gentleman's Magazine for June 1787, which seem worthy of particular attention.

In the Swedish Transactions for the year 1747, a method is given of preparing flax in such a manner as to resemble cotton in whiteness and softness, as well as in coherence. For this purpose, a little sea-water is to be put into an iron pot or an untinned copper-kettle, and a mixture of equal parts of birch-ashes and quicklime strewed upon it; a small bundle of flax is to be opened and spread upon the surface, and covered with more of the mixture, and the stratification continued till the vessel is sufficiently filled. The whole is then to be boiled with sea-water for ten hours, fresh quantities of water being occasionally supplied in proportion to the evaporation, that the matter may never become dry. The boiled flax is to be immediately washed in the sea by a little at a time, in a basket, with a smooth stick at first while hot; and when grown cold enough to be borne by the hands, it must be well rubbed, washed with soap, laid to bleach, and turned and watered every day. Repetitions of the washing with soap expedite the bleaching; after which the flax is to be beat, and again well washed; when dry, it is to be worked and carded in the same manner as common cotton, and pressed betwixt two boards for 48 hours. It is now fully prepared and fit for use. It loses in this process near one-half its weight, which is abundantly compensated by the improvement made in its quality.

FLA'XCOMB. *s.* (*flax* and *comb.*) The instrument with which the fibres of flax are cleansed from the brittle parts.

FLA'XDRESSER. *s.* (*flax* and *dress.*) He that prepares flax for the spinner.

FLA'XEN. *a.* (from *flax.*) 1. Made of flax (*Thomson*). 2. Fair, long, and flowing (*Addison*).

FLA'XWEED. *s.* A plant.

To FLAY. *v. a.* (*vlaen*, Dutch.) 1. To strip off the skin (*Raleigh*). 2. To take off the skin or surface of any thing (*Swift*).

FLA'YER. *s.* (from *flay.*) He that strips off the skin of any thing.

FLEA. *s.* (ꝼlea, Saxon.) A small insect remarkable for its agility in leaping, which sucks the blood of larger animals. See Pulex.

To Flea. *v. a.* (from the noun.) To clean from fleas.

Flea-wort. See Psyllium.

Flea-bane. See Conyza.

Flea-bane (Shrubby African). See Tarcho.

FLEA'BITE. Flea'biting. *s.* (*flea* and *bite.*) 1. Red marks caused by fleas (*Wiseman*). 2. A small hurt or pain like that caused by the sting of a flea (*Harvey*).

FLE'ABITTEN. *a.* (*flea* and *bite.*) 1. Stung by fleas. 2. Mean; worthless (*Cleaveland*).

FLEAK. *s.* (from *floccus*, Latin. See Flake.) A small lock, thread, or twist (*More*).

FLEAM. *s.* An instrument used to bleed cattle, which is placed on the vein, and then driven by a blow. A case of fleams, as it is called by farriers, comprehends six sorts of instruments; two hooked ones, called drawers, and used for cleaning wounds; a pen-knife; a sharp-pointed lancet for making incisions; and two proper fleams, one sharp and the other broad-pointed. These last are somewhat like the point of a lancet, fixed in a flat handle, and no longer than is just necessary to open the vein.

FLECHE, a town of France, in the department of Sarte. Here is the noblest college in France, built in 1603, by Henry IV.; and in the chapel are deposited his heart and that of his queen in gold boxes. It is seated on the river Loire. Lat. 47. 39 N. Lon. 0. 3 W.

FLECHIER (Esprit), a famous French bishop, born in 1632, at Perne, in Provence. He was greatly admired as a preacher at Paris in 1659, and his funeral orations put him upon a level with Bossuet. In 1679 he published his History of Theodosius the Great. In 1685 he was made bishop of Lavaur; on which occasion the king said, "Be not surprised that I so long delayed to reward your merit. I was afraid of losing the pleasure of hearing your discourses." Shortly after he was promoted to the see of Nismes. As a bishop he was most exemplary, and by the mildness of his behaviour he drew several protestants to the Roman communion. When a famine raged in 1709, his charity was unbounded, and was manifested to all persons without any respect to religious persuasion. He died in 1710. His works are; 1. Œuvres Méslées, 12mo.; 2. Panegyrics of the Saints; 3. Funeral Orations; 4. Sermons; 5. The Life of Cardinal Ximenes; 6. Letters; 7. The Life of Cardinal Commendon; 8. Posthumous Works.

To FLECK. *v. a.* (*fleck*, German, a spot.) To spot; to streak; to dapple (*Sandys*).

To FLE'CKER. *v. a.* (from *fleck*.) To spot; to mark with strokes or touches (*Shak.*).

FLECKNOE (Richard), an English poet, who is said to have been originally a jesuit. He succeeded Dryden as poet-laureat at the revolution, for which that poet attacked him in a satire, called Mac Flecnoe. He wrote some plays; as, Demoiselles à la Mode, 1667; Ermina, or the Chaste Lady; &c. He died about the end of the 17th century.

FLED. The preterit and participle of *flee*.

FLEDGE. *a.* (*fledcren*, to fly, Dutch.) Full-feathered; able to fly (*Herbert*).

To FLEDGE. *v. a.* (from the adjective.) To furnish with wings; to supply with feathers (*Pope*).

To FLEE. *v. n.* pret. *fled.* (ꝼlean, Saxon.) To run from danger; to have recourse to shelter (*Tillotson*).

FLEECE. *s.* (ꝼlýꞅ, ꝼleꞅ, Sax.) As much wool as is shorn from one sheep (*Shakspeare*).

FLEECE (Golden), in ancient mythology, was the skin or fleece of the ram upon which Phryxus and Hella are supposed to have swam over the sea to Colchis; and which, being sacrificed to Jupiter, was hung upon a tree in the grove of Mars, guarded by two brazen-hoofed bulls, and a monstrous dragon that never slept; but was taken and carried off by Jason and the Argonauts.

To FLEECE. *v. a.* (from the noun.) 1. To clip the fleece of a sheep. 2. To strip; to plunder, as a sheep is robbed of its wool (*Addison*).

FLEE'CED. *a.* (from *fleece*.) Having fleeces of wool (*Spenser*).

FLEE'CY. *a.* (from *fleece*.) Woolly; covered with wool (*Prior*).

FLEECY-HOSIERY, a very useful kind of manufacture, in which fine fleeces of wool are interwoven into a cotton piece of the common stocking texture. The following is the specification of the patent granted to Mr. Holland, of Broad-street, Bloomsbury, in the county of Middlesex, for a method of making stockings, socks, waistcoats, and other clothing, for persons afflicted with complaints requiring warmth, and for common use in cold climates, and for making false or downy calves in stockings. It is dated September 22, 1788.

He describes the nature of his invention in these words: "Having in the common stocking-frame, twisted silk, cotton yarn, flaxen or hempen thread, worsted or woollen yarn, or any such-like twisted or spun materials, begin the work in the common manner of manufacturing hosiery, and having worked one or more course or courses in the common way, begin to add a coating, thus: draw the frame over the arch, and then hang wool or jersey, raw or unspun, upon the beards of the needles, and slide the same off their beards upon their stems, till it comes exactly under the nibs of the sinkers; then sink the jacks and sinkers, and bring forward the frame, till the wool or jersey is drawn under the beards of the needles, and, having done this, draw the frame over the arch, and place a thread of spun materials upon the needles (under the nibs of the sinkers), and proceed in finishing the course in the usual way of manufacturing hosiery with spun materials. Any thing manufactured in this way has, on the one side, the appearance of common hosiery, and on the other side the appearance of raw wool. The raw or unspun materials may be worked in with every course, or with every second, third, or other course or courses, in quantity proportioned to the warmth and thickness required. The above-mentioned raw or unspun materials may be fixed also thus: having drawn the frame over the arch, hang them upon the beards of the needles, slide them off the beards upon their stems, and without sinking the jacks and sinkers, draw the frame off the arch, and bring the raw or unspun materials forward under the beards of the needles: then draw the frame over the arch, and proceed in finishing the course, as before directed. The said raw or unspun materials may be fixed likewise thus: hang them upon the beards of the needles, without having the frame over the arch, and slide them off their beards upon their stems; then bring forward the frame till the raw or unspun materials are drawn under the beards of the needles, and having done this, draw the frame over the arch, and proceed in finishing the course as before directed. Hosiery may be coated by any of these methods, not only with wool and jersey, but also with silk, cotton, flax, hemp, hair, or other things of the like nature, raw or unspun, but the method first described fixes them most firmly. The common stocking-frame is mentioned above, but any other frame, upon a similar principle, may answer the purpose. The method of making the false or downy calves in stockings, is by working raw or unspun wool or jersey, or any other raw or unspun materials, into the calves of stocking, in the different methods before described, and to any required form or thickness." The latter use to which this invention is applied, we may be allowed to say, is somewhat ludicrous.

To **FLEER.** *v. n.* (ꝼleaꞃdian, to trifle, Saxon.) 1. To mock; to gibe; to jest with insolence and contempt (*Swift*). 2. To leer; to grin with an air of civility.

Fleer. *s.* (from the verb.) 1. Mockery expressed either in words or looks (*Shakspeare*). 2. A deceitful grin of civility (*South*).

FLE'ERER. *s.* (from *fleer*). A mocker; a fawner.

FLEET, Fleot, Flot. Are all derived from the Saxon ꝼleoꞇ, which signifies a bay or gulf (*Gibson's Cambden*).

Fleet. *s.* (ꝼloꞇa, Saxon.) A company of ships; a navy (*Prior*).

Fleet. *s.* (ꝼleoꞇ, Saxon.) A creek; an inlet of water (*Mortimer*).

Fleet. *a.* (*fliotur*, Islandish.) 1. Swift of pace; quick; nimble; active. 2. (In the husbandry of some provinces.) Light; superficially fruitful (*Mortimer*). 3. Skimming the surface (*Mortimer*).

To **Fleet.** *v. n.* (ꝼloꞇan, Saxon.) 1. To fly swiftly; to vanish (*Shakspeare*). 2. To be in a transient state (*Digby*).

To **Fleet.** *v. a.* 1. To skim the water (*Spenser*). 2. To live merrily, or pass time away lightly (*Shakspeare*). 3. (In the country.) To skim milk.

Fleet, commonly implies a company of ships of war, belonging to any prince or state; but sometimes it denotes any number of trading-ships, employed in a particular branch of commerce.

In sailing, a fleet of men of war is usually divided into three squadrons; the admiral's, the vice-admiral's, and the rear-admiral's squadron, all which, being distinguished by their flags and pendants, are to put themselves, and, as near as may be, to keep themselves in their customary places, viz. the admiral, with his squadron, to sail in the van, that so he may lead the way to all the rest in the day-time, by the sight of his flag on the maintopmast-head; and in the night-time by his lights or lanterns. The vice-admiral and his squadron are to sail in the centre, or middle of the fleet. The rear-admiral and the ships of his squadron, to bring up the rear. But sometimes other divisions are made; and those composed of the lighter ships and the best sailers are placed as wings to the van, centre, and rear.

Merchant-fleets generally take their denomination from the place they are bound to, as the Turkey fleet, East India fleet, &c. These, in time of peace, go in fleets for their mutual aid and assistance: in time of war, besides this security, they likewise procure convoys of men of war, either to escort them to the place whither they are bound, or only a part of the way, to a certain place or latitude, beyond which they are judged out of danger of privateers, &c.

Fleet, a prison in London, to which persons are committed for contempt of the king and his laws, particularly of his courts of justice; or for debt, where any person will not, or is unable to pay his creditors. There are large rules, and a warden belonging to the Fleet prison, which had its name from the float or fleet of the river or ditch on the side whereof it stands.

Fleet, a river in Kircudbrightshire, which winds through a beautiful valley, and enters Wigton Bay, at Gatehouse. On the W. side of the river are the vestiges of a camp, a druidical circle, and a vitrified fort.

FLE'ETINGDISH. *s.* (from *fleet* and *dish*.) A skimming bowl.

FLE'ETLY. *ad.* (from *fleet.*) Swiftly; nimbly; with swift pace.

FLE'ETNESS. *s.* (from *fleet.*) Swiftness of course; nimbleness; celerity.

FEEETWOOD (William), a very learned English bishop in the beginning of the 18th century, of an ancient family in Lancashire. He distinguished himself during king William's reign, by his *Inscriptionum Antiquarum Sylloge*, by several sermons he preached on public occasions, and by his Essay on Miracles. It was designed by king William to give him a canonry of Windsor. The grant did not pass the seals before the king's death; but the queen gave it him, and he was installed in 1702. In 1703 he took a resolution to retire; and in 1707 published, without his name, his *Chronicon Pretiosum*. In 1708 he was nominated by the queen to the see of St. Asaph. The change of the queen's ministry gave him much regret. In 1715 he published a pamphlet, intitled "The 13th chapter of Romans vindicated from the abusive senses put upon it." In 1714 he was translated to the bishopric of Ely; and died in 1723, aged 67. He published several other sermons and tracts, and was a man of great learning and exemplary piety.

FLEMISH, or the **Flemish tongue**, is that which we otherwise call Low Dutch, to distinguish it from the German, whereof it is a corruption and a kind of dialect. (See German.) It differs from the Walloon, which is a corruption of the French language. The Flemish is used through all the provinces of the Netherlands.

Flemish-bricks, a neat, strong, yellow kind of bricks, brought from Flanders, and commonly used in paving yards, stables, &c. being preferable for such purposes to the common bricks.

FLENSBURG, a large town of Sleswick, in Holland. Lat. 54. 50 N. Lon. 9. 47 E.

FLESH. *s.* (ꝼlœc, Saxon.) 1. The body distinguished from the soul (*Shak.*). 2. The muscles distinguished from the skin, bones, and tendons (*New Test.*). 3. Animal food distinguished from vegetable (*Locke*). 4. The body of beasts or birds used in food, distinct from fishes (*Brown*). 5. Animal nature (*Genesis*). 6. Carnality; corporeal appetites (*Smalridge.*) 7. A carnal state; worldly disposition (*Romans*). 8. Near relation (*Gen.*). 9. The outward or literal sense. The Orientals termed the immediate or literal signification of any precept or type *the flesh*, and the remote or typical meaning *the spirit* (*John*).

Flesh, in anatomy, a fibrous part of the animal body, soft and bloody, being that of which most of the other parts are composed, and by which they are connected together; or, more properly, it is that part of the body where the blood-vessels are so small as only to retain blood enough to preserve their colour red.

By chemical analysis it is found that muscular flesh is composed of a great number of fibres or threads, commonly of a reddish or whitish colour; but its appearance is too well known to require any description. Hitherto it has not been subjected to a perfectly accurate chemical analysis. From the facts ascertained by Thouvenel and Fourcroy, it appears that the muscles are composed chiefly of fibrin, to which they owe their fibrous structure and their form; and that they contain also

2. Albumen
3. Gelatin
4. Extractive
5. Phosphat of soda
6. Phosphat of ammonia
7. Phosph. of lime and carb. of ditto.

For the discovery of the last ingredients we are indebted to Mr. Hatchett, who found that 500 parts of beef-muscle left, after combustion, a residuum of 25.6 parts, consisting chiefly of these salts. When muscles are long boiled in water, Mr. Hatchett found that the greater part of the phosphat of lime, as well as of the alkaline phosphats, was dissolved; for the muscle, after this treatment, when dissolved in nitric acid, yielded scarcely any phosphat of lime; whereas if it were dissolved directly in nitric acid, a precipitate of phosphat of lime was thrown down by ammonia. Hence it would appear, either that the phosphat of lime is united to gelatin, or that it is rendered soluble by means of it. The carbonat of lime still remains after the action of water, and is converted into oxalat when the muscle is treated with nitric acid.

The muscles of different animals differ exceedingly from each other in their appearance and properties, at least as articles of food; but we know little of their chemical differences. The observations of Thouvenel were alone directed to that object, and they are imperfect. The flesh of the ox contains, according to him, the greatest quantity of insoluble matter, and leaves the greatest residuum when dried: the flesh of the calf is more aqueous and mucous: the land and water turtle yield more matter to water than the muscle of the ox; but Thouvenel ascribes this difference to foreign bodies, as ligaments, &c. mixed with the muscle of the turtle: snails yield to water a quantity of matter intermediate between that given by beef and veal: with them the muscles of frogs, cray-fishes, and vipers, agree nearly in this respect; but the muscles of fresh-water fishes, notwithstanding their softness, yield a considerably smaller proportion.

When meat is boiled, it is obvious that the gelatin, the extractive, and a portion of the salts, will be separated, while the coagulated albumen and fibrin will remain in a solid state. Hence the flavour and the nourishing nature of soups is derived from the extractive and gelatin. When meat is roasted, on the other hand, all these substances continue in it, and the taste and odour of the extractive are greatly heightened by the action of the fire. Hence the superior flavour of roasted meat.

To Flesh. *v. a.* To initiate (*Government of the Tongue*). 2. To establish in any practice (*Sidney*). 3. To glut; to satiate (*Shak.*).

FLE'SHBROTH. *s.* (*flesh* and *broth.*) Broth made by decocting flesh (*Wiseman*).

FLE'SHCOLOUR. *s.* (*flesh* and *colour.*) The colour of flesh (*Locke*).

FLE'SHFLY. *s.* (*flesh* and *fly.*) A fly that feeds upon flesh, and deposits her eggs in it (*Shakspeare*).

FLE'SHHOOK. *s.* (*flesh* and *hook.*) A hook to draw flesh from the caldron (*Samuel*).

FLE'SHLESS. *a.* (from *flesh.*) Without flesh.

FLE'SHLINESS. *s.* (from *fleshy.*) Carnal passions or appetites (*Ascham*).

FLE'SHLY. *a.* (from *flesh.*) 1. Corporeal (*Denham*). 2. Carnal; lascivious (*Milton*). 3. Animal; not vegetable (*Dryden*). 4. Human; not celestial; not spiritual (*Milt.*).

FLE'SHMEAT. *s.* (*flesh* and *meat.*) Animal food; the flesh of animals prepared for food (*Floyer*).

FLE'SHMENT *s.* (from *flesh.*) Eagerness gained by a successful initiation (*Shak.*).

FLE'SHMONGER. *s.* (from *flesh.*) One who deals in flesh; a pimp (*Shakspeare.*)

FLE'SHPOT. *s.* (*flesh* and *pot.*) A vessel in which flesh is cooked; thence plenty of flesh (*Taylor.*)

FLE'SHQUAKE. *s.* (*flesh* and *quake.*) A tremour of the body (*Ben Jonson*).

FLE'SHY. *a.* (from *flesh.*) 1. Full of flesh; fat; musculous (*Ben Jonson*). 2. Pulpous; plump (*Bacon*).

Fleshy-footed. A horse is said to be fleshy footed, when that part of the bottom of the foot on each side of the frog (called the outer sole) is preternaturally prominent, constituting a convexity above the wall or crust of the hoof, where the shoe should have its proper bearing upon the foot of the horse. In feet of this description, the outer sole, from repeated bruising and battering in constant work upon hard roads, or from an injudicious and destructive paring away with the butteris, is so exceedingly thin as to be indented with the slightest impression, and being too weak to resist the action of the interior vessels, projects and becomes bulbous. Great care is required in shoeing horses labouring under this defect: the inner part of the web of the shoe should be so completely hollowed as not to admit the least chance of bearing upon the prominent part; if it do, tenderness and pain (if not lameness) must inevitably ensue. In cases of this kind, neither the butteris nor drawing-knife should be permitted; they are a worse remedy than the disease.

Fleshy leaf. In botany. Folium carnosum. Full of pulp within: as in sedum and other succulent plants. The substance more stiff than in the pulpy leaf: folium pulposum. Applied to the capsule in mesembry-anthemum—and to the root, in valerian, &c.

FLETA, the name given to an unknown writer, who lived about the end of the reign of Edward II. and beginning of that of Edward III.: and who, being a prisoner in the Fleet, wrote there an excellent treatise on the common law of England.

FLETCHER. See Beaumont.

Fle'tcher. *s.* (from *fleche*, an arrow, French.) A manufacturer of bows and arrows (*Mortimer*).

FLET. The participle passive of *To fleet.* Skimmed; deprived of the cream (*Mortimer*).

FLEURI (Claude), one of the best French critics and historians of his age, was born at Paris in 1640. He applied himself to the law, was made advocate for the parliament of Paris, and attended the bar nine years; he then entered into orders, and was made preceptor to the princes of Conti. In 1689 the king made him sub-preceptor to the dukes of Burgundy, Anjou, and Berry; and in 1706, when the education of those young princes was completed, the king gave him the priory of Argenteville belonging to the Benedictines in the diocese of Paris. In 1716 he was chosen counsellor to Louis XV. and died in 1723. He was the author of a great number of esteemed French works: the principal of which are, 1. An ecclesiastical history, in 20 volumes, the last of which ends with the year 1441. 2. The manners of the Israelites and Christians. 3. Institutions of ecclesiastical law. 4. An historical catechism. 5. On the choice and method of study. 6. The duties of masters and servants, &c.

FLEURS, a small town of Namur, in the Austrian Netherlands, 15 miles W. of Namur. Lat. 50. 30 N. Lon. 4. 36 E.

FLEW. The preterit of *fly*.

Flew. *s.* The large chaps of a deep-mouthed hound (*Hanmer*).

FLE'WED. *a.* (from *flew.*) Chapped; mouthed (*Shakspeare*).

FLEXA'NIMOUS. *a.* (*flexanimus*, Lat.) Having power to change the disposition of the mind (*Howel*).

FLEXIBI'LITY. *s.* (*flexibilité*, French.) 1. The quality of admitting to be bent; pliancy (*Newton*). 2. Easiness to be persuaded; ductility of mind; compliance; facility (*Hammond*).

FLE'XIBLE. *a.* (*flexibilis*, Latin.) 1. Possible to be bent; not brittle; pliant; not stiff (*Bacon*). 2. Not rigid; not inexorable; complying; obsequious (*Bacon*). 3. Ductile; manageable (*Locke*). 4. That may be accommodated to various forms and purposes (*Rogers*).

FLE'XIBLENESS. *s.* (from *flexible.*) 1. Possibility to be bent; not brittleness; easiness to be be bent; pliancy (*K. Charles*). 2. Facility; obsequiousness; compliance. 3. Ductility; manageableness (*Locke*).

FLE'XILE. *a.* (*flexilis*, Latin.) Pliant; easily bent; obsequious to any power or impulse (*Thomson*).

FLE'XION. *s.* (*flexio*, Latin.) 1. The act of bending. 2. A double; a bending (*Bacon*). 3. A turn toward any part or quarter (*Bacon*).

FLEXOR, in anatomy. (*flexor.*) The name of several muscles whose office it is to bend parts into which they are inserted.

F. accessorius digitorum pedis. See Flexor longus digitorum pedis.

F. brevis digitorum pedis, perforatus, sublimis. Perforatus seu sublimis of Douglas. A flexor muscle of the toes, situated on the foot. It arises by a narrow tendinous and fleshy beginning from the inferior protuberance of the os calcis. It likewise derives many of its fleshy fibres from the adjacent aponeurosis, and soon forms a thick belly, which divides into four portions. Each of these portions terminates in a flat tendon, the fibres of which decussate, to afford a passage to a tendon of the long flexor, and afterwards re-uniting, are inserted into the second phalanx of each of the four smaller toes. This muscle serves to bend the second joint of the toes.

F. brevis minimi digiti pedis. Parathenar minor of Winslow. This little muscle is situated along the inferior surface and outer edge of the metatarsal bone of the little toe. It arises tendinous from the basis of that bone, and from the ligaments that connect it to the os cuboides. It soon becomes fleshy, and adheres almost the whole length of the metatarsal bone, at the anterior extremity of which it forms a small tendon that is inserted into the root of the first joint of the little toe. Its use is to bend the little toe.

F. brevis pollicis manus. Flexor secundi internodii of Douglas. Thenar of Winslow. This muscle is divided into two portions by the tendon of the flexor longus pollicis. The outermost portion arises tendinous from the anterior part of the os trapezoides and internal annular ligament. The second, or innermost and thickest portion, arises from the same bone, and likewise from the os magnum, and os cuneiforme. Both these portions are inserted tendinous into the sesamoid bones, and second bone of the thumb. The use of this muscle is to bend the second joint of the thumb.

F. brevis pollicis pedis. A muscle of the great toe, that bends the first joint of the great toe. It is situated upon the metatarsal bone of the great toe, arises tendinous from the under and anterior part of the os calcis, and from the under part of the os cuneiforme externum. It soon becomes fleshy and divisible into two portions, which do not separate from each other till they have reached the anterior extremity of the metatarsal bone of the great toe, where they become tendinous, and then the innermost portion unites with the tendon of the abductor, and the outermost with that of the adductor pollicis. They adhere to the external os sesamoideum, and are finally inserted into the root of the first joint of the great toe. These two portions, by their separation, form a groove, in which passes the tendon of the flexor longus pollicis.

F. carpi radialis. This, which is the radialus internus of Albinus and Winslow, is a long thin muscle, situated obliquely at the inner and anterior part of the fore-arm, between the palmaris longus and the pronator teres. It arises tendinous from the inner condyle of the os humeri, and, by many fleshy fibres, from the adjacent tendinous fascia. It descends along the inferior edge of the pronator teres, and terminates in a long, flat, and thin tendon, which afterwards becomes narrower and thicker, and after passing under the internal annular ligament, in a groove distinct from the other tendons of the wrist, it spreads wider again, and is inserted into the fore and upper part of the metacarpal bone that sustains the fore finger. It serves to bend the hand, and its oblique direction may likewise enable it to assist in its pronation.

F. carpi ulnaris. Ulnaris internus of Winslow and Albinus. A muscle, situated on the cubit or fore arm, that assists the former in bending the arm. It arises tendinous from the inner condyle of the os humeri, and by a small fleshy origin, from the anterior edge of the olecranon. Between these two portions we find the ulnar nerve passing to the fore-arm. Some of its fibres arise likewise from the tendinous fascia that covers the muscles of the fore-arm. In its descent it soon becomes tendinous, but its fleshy fibres do not entirely disappear till it has reached the lower extremity of the ulna, where its tendon spreads a little, and, after sending off a few fibres to the external and internal and annular ligaments, is inserted into the os pisiforme.

F. longus digitorum pedis, profundus perforans. A flexor muscle of the toes, situated along the posterior part and inner side of the leg. It arises fleshy from the back part of the tibia, and after running down to the internal ancle, its tendon passes under a kind of annular ligament, and then through a sinuosity at the inside of the os calcis. Soon after this it receives a small tendon from the flexor longus pollicis pedis, and about the middle of the foot it divides into four tendons, which pass through the slits of the flexor brevis digitorum pedis, and are inserted into the upper part of the last bone of all the lesser toes. About the middle of the foot this muscle unites with a fleshy portion, which from the name of its first describer, has been usually called massa carnea Jacobi Sylvii: it is also termed flexor accessorius digitorum pedis. This appendage arises by a thin fleshy origin, from most part of the sinuosity of the os calcis, and likewise by a thin tendinous beginning from the anterior part of the external tubercle of that bone; it soon becomes all fleshy, and unites to the long flexor just before it divides into its four tendons. The use of this muscle is to bind the last joint of the toes.

F. longus pollicis manus. This muscle, which is so named by Winslow and Albinus, is the flexor tertii internodii of Douglas. It is placed at the side of the last described muscle, and is covered by the extensores carpi radiales. It arises fleshy from the anterior surface of the radius, immediately below the insertion of the biceps, and is continued down along the oblique ridge, which serves for the insertion of the supinator brevis, as far as the pronator quadratus. Some of its fibres spring likewise from the neighbouring edge of the interosseous ligament. Its tendon passes under the internal annular ligament of the wrist, and after running along the inner surface of the first bone of the thumb, between the two portions of the flexor brevis pollicis, goes to be inserted into the last joint of the thumb, being bound down in its way by the ligamentous expansion that is spread over the second bone. In some subjects we find a tendinous portion arising from the inner condyle of the os humeri, and forming a fleshy slip that commonly terminates near the upper part of the origin of this muscle from the radius. The use of this muscle is to bend the last joint of the thumb.

F. longus pollicis pedis. This muscle is situated along the posterior part of the leg. It arises tendinous and fleshy a little below the head of the fibula, and its fibres continue to adhere to that bone almost to its extremity. A little above the heel, it terminates in a round tendon, which, after passing in a groove formed at the posterior edge of the astragalus, and internal and lateral part of the os calcis, in which it is secured by an annular ligament, goes to be inserted into the last bone of the great toe, which it serves to bend.

F. ossis metacarpi pollicis. Opponens pollicis. Flexor primi internodii of Douglas. This muscle is situated under the abductor brevis pollicis, which it resembles in its shape. It arises tendinous and fleshy from the os scaphoides, and from the anterior and inner part of the internal annular ligament. It is inserted tendinous and fleshy into the under and anterior part of the first bone of the thumb. It serves to turn the first bone of the thumb upon its axis, and at the same time to bring it inwards opposite to the other fingers.

F. parvi minimi digiti manus. Abductor minimi digiti Hypothenar Riolani of Douglas. The situation of this muscle is along the inner surface of the metacarpal bone of the little finger. It arises tendinous and fleshy from the hook-like process of the unciform bone, and likewise from the anterior surface of the adjacent part of the annular ligament. It terminates in a flat tendon, which is connected with that of the abductor minimi digiti, and inserted into the inner and anterior part of the upper end of the first bone of the little finger. It serves to bend the little finger, and likewise to assist the abductor.

F. profundus perforans. Profundus of Albinus. Perforans of Douglas. It is a muscle situated on the fore arm, immediately under the perforatus, which it greatly resembles in its shape. It arises fleshy from the external side, and upper part of the ulna for some way downwards, and from a large portion of the interosseous ligament. It splits into four tendons a little before it passes under the annular ligament of the wrist, and these pass through the slits in the tendons of the flexor sublimis, to be inserted into the fore and upper part of the third or last bone of all the four fingers, which joint they bend.

F. sublimis perforatus. This muscle, which is the perforatus of Cowper, Douglas, and Winslow, is by Albinus and others named sublimis. It has got the name of perforatus from its tendons being perforated by those of another flexor muscle of the fingers, called the perforans. They who give it the appellation of sublimis, consider its situation with respect to the latter, and which, instead of perforans, should have been distinguished by the name profundus. It is a long muscle, situated most commonly at the anterior and inner part of the fore-arm, between the palmaris longus and the flexor carpi ulnaris; but, in some subjects, we find it placed under the former of these muscles, between the flexor carpi ulnaris, and the flexor carpi radialis. It arises, tendinous and fleshy, from the inner condyle of the os humeri, from the inner edge of the coronoid process of the ulna, and from the upper and fore part of the radius, down to near the insertion of the pronator teres. A little below the middle of the fore-arm its fleshy belly divides into four portions, which degenerate into as many round tendons, that pass altogether under the internal annular ligament of the wrist, after which they separate from each other, become thinner and flatter, and running along the palm of the hand, under the aponeurosis palmaris, are inserted into the upper part of the second bone of each finger. Previous to this insertion, however, the fibres of each tendon decussate near the extremity of the first bone, so as to afford a passage to a tendon of the perforans. Of these four tendons, that of the middle-finger is the largest, that of the fore-finger next in size, and that of the little-finger the smallest. The use of this muscle is to bend the second joint of the fingers.

F. tertii internodii. See FLEXOR LONGUS POLLICIS MANUS.

FLE'XUOUS. *a.* (*flexuosus*, Latin.) 1. Winding; full of turns and meanders; tortuous (*Digby*). 2. Bending; variable; not steady (*Bacon*).

FLEXUOUS. (*zigzag*, with.) In botany. Changing its direction in a curve—from joint to joint, or from bud to bud, in the stem, as in ptelea, smilax, solidago flexicaulis—from flower to flower in the peduncle, as in aira flexuosa and some other grasses.

FLE'XURE. *s.* (*flexura*, Latin.) 1. The form or direction in which any thing is bent (*Ray*). 2. The act of bending (*Shakspeare*). 3. The part bent; the joint (*Sandys*). 4. Obsequious or servile cringe (*Shakspeare*).

FLEXURE (Contrary), in the geometry of curves, is where the bending of the line becomes directed a different way, as about the middle point of the printing letter S. For the determination of points of contrary flexure, see INFLECTION.

To FLI'CKER. *v. a.* (*fligheren*, Dutch.) To flutter; to play the wings (*Dryden*).

FLI'ER. *s.* (from *fly*). 1. One that runs away; a fugitive; a runaway (*Shakspeare*). 2. That part of a machine which, by being put into a more rapid motion than the other parts, equalizes and regulates the motion of the rest; as in a jack (*Swift*).

FLIGHT. *s.* (from *to fly*.) 1. The act of flying or running from danger (*Denham*). 2. The act of using wings; volation (*Spenser*). 3. Removal from place to place by means of wings (*Esdras*). 4. A flock of birds flying together (*Bacon*). 5. The birds produced in the same season: as the harvest flight of pigeons. 6. A volley; a shower (*Chevy Chase*). 7. The space past by flying. 8. Heat of imagination; sally of the soul (*Denham*). 9. Excursion on the wing (*Tillotson*). 10. The power of flying (*Shakspeare*).

FLI'GHTY. *a.* (from *flight*.) 1. Fleeting; swift (*Shakspeare*). 2. Wild; full of imagination.

FLI'MSY. *a.* Weak; feeble. 2. Mean; spiritless; wanting force (*Pope*).

To FLINCH. *v. n.* (corrupted from *fling*.) 1. To shrink from any suffering or undertaking (*South*). 2. To fail (*Shakspeare*).

FLI'NCHER. *s.* (from the verb.) He who shrinks or fails in any matter.

To FLING. *v. a.* preter. *flung*; part. *flung* or *flong*. (from *fligo*, Lat. *Skinner*.) 1. To cast from the hand; to throw (*Dryden*). 2. To dart; to cast with violence (*Denham*). 3. To scatter (*Pope*). 4. To drive by violence (*Burnet*). 5. To move forcibly (*Addison*). 6. To cast (*Addison*). 7. To force into another condition (*Spenser*). 8. *To* FLING *away*. To eject; to dismiss. 9. *To* FLING *down*. To demolish; to ruin. 10. *To* FLING *off*. To baffle in the chase.

To FLING. *v. n.* 1. To flounce; To

wince; to fly into violent and irregular motions (*Tillotson*). 2. *To* Fling *out*. To grow unruly or outrageous (*Shakspeare*).

Fling. *s.* (from the verb.) 1. A throw; a cast. 2. A gibe; a sneer; a contemptuous remark (*Addison*).

Fling. In the manage, is a term used to express the fiery and obstinate action of an unruly horse. To fling like a cow, is to raise only one leg, and give a blow with it. To fling or kick with both the hind-legs is called yerking. See Yerk.

FLI'NGER. *s.* (from the verb.) 1. He who throws. 2. He who jeers.

FLINT. See Pyromachus.

Flint, a town of North Wales, and capital of a county to which it gives name; situated a small distance from the river Dee; with a castle, where the unfortunate Richard II. was deposed by the duke of Lancaster: united with several other places, it returns one member to the British parliament. Lat. 53. 16 N. Lon. 3. 2 W.

FLINTSHIRE, a county of North Wales, bounded on the N. by the Irish Sea, on the N.E. by the river Dee, on the E. by Cheshire, on the S. and W. by Denbighshire; about 27 miles long, and from 7 to 10 broad. Besides this, there is a part of Flintshire no way united with the rest of the county; bounded on the N. by Cheshire, on the E. and S. by Shropshire, and on the West by Denbighshire, which is 8 miles long, and 6 broad. The county is divided into 5 hundreds, in which are two market towns, 28 parishes, 7780 houses, and 39,622 inhabitants. The country is mountainous, the hills being generally barren on the surface, but abounding with lead ore, calamine, coals, &c. The valleys are fertile. The whole county contains 160,000 acres, of which 25,000 are uncultivated, including wood-lands. The county sends one member to the British parliament, besides the one sent by the county town, in conjunction with the other towns: The principal rivers are the Clwyd, Dee, Elwy, Sevion, and Wheeler.

FLI'NTY. *a.* (from *flint.*) 1. Made of flint; strong (*Dryden*). 2. Full of stones (*Bacon*). 3. Hard of heart; cruel; savage; inexorable (*Shakspeare*).

FLIP. *s.* (A cant word.) A liquor much used in ships, made by mixing beer with spirits and sugar (*Dennis*).

FLI'PPANT. *a.* (Of no great authority.) 1. Nimble; moveable. It is used only of the act of speech (*Addison*). 2. Pert; petulant; waggish (*Thomson*).

FLI'PPANTLY. *ad.* (from the adjective.) In a flowing prating way.

To FLIRT. *v. a.* (*Skinner* thinks it formed from the sound.) 1. To throw any thing with a quick elastic motion (*Swift*). 2. To move with quickness (*Dorset*).

To Flirt. *v. n.* 1. To jeer; to gibe at one. 2. To run about perpetually; to be unsteady and fluttering.

Flirt. *s.* (from the verb.) 1. A quick elastic motion (*Addison*). 2. A sudden trick (*Ben Jonson*). 3. A pert hussey (*Addison*).

FLIRTA'TION. *s.* (from *flirt.*) A quick sprightly motion (*Pope*).

To FLIT. *v. n.* (*flitter*, Danish). 1. To fly away (*Spenser*). 2. To remove; to migrate (*Hooker*). 3. To flutter; to rove on the wing (*Dryden*). 4. To be flux or unstable (*Dryden*).

Flit. *a.* (from *fleet*). Swift: not used (*Spenser*).

FLITCH. *s.* (flicce, Saxon.) The side of a hog salted and cured (*Swift*).

FLI'TTERMOUSE. *s.* The bat.

FLI'TTING. *s.* (flit, Saxon.) An offence; a fault; a failure (*Psalms*).

FLIX. *s.* (corrupted from *flax.*) Down; fur; soft hair (*Dryden*).

To FLOAT. *v. n.* (*flotter*, French.) 1. To swim on the surface of the water (*Shakspeare*). 2. To move without labour in a fluid (*Dry.*). 3. To pass with a light irregular course (*Locke*).

To Float. *v. a.* To cover with water (*Pope*).

Float. *s.* (from the verb.) 1. The act of flowing; the flux (*Hooker*). 2. Any body so contrived or formed as to swim upon the water (*L'Estrange*). 3. The cork or quill by which the angler discovers the bite of a fish (*Walton*). 4. A cant word for a level (*Mortimer*).

Float-boards, those boards fixed to water-wheels of under-shot-mills, serving to receive the impulse of the stream, whereby the wheel is carried round. (See the articles Wheel and Mill.) It is no advantage to have too great a number of float-boards; because, when they are all struck by the water in the best manner that it can be brought to come against them, the sum of all the impulses will be but equal to the impulse made against one float-board at right angles, by all the water coming out of the penstock through the opening, so as to take place on the float-board. The best rule in this case is, to have just so many, that each of them may come out of the water as soon as possible, after it has received and acted with its full impulse. As to the length of the float-board, it may be regulated according to the breadth of the mill.

FLOATING BODIES, are those which swim on the surface of a fluid, the most interesting of which are ships and vessels employed in war and commerce. It is known to every seaman, of what vast moment it is to ascertain the stability of such vessels, and the positions they assume when they float freely on the surface of the water. To be able to accomplish this, it is necessary to understand the principles on which that stability and these positions depend. A floating body is pressed downward by its own weight in a vertical line passing through its centre of gravity; and it is supported by the upward pressure of a fluid, which acts in a vertical line that passes through the centre of gravity of the part which is under the water; and without a coincidence between these two lines, in such a manner as that both centres of gravity may be in the same vertical line, the solid will turn on an axis, till it gains a position in which the equilibrium of floating will be permanent. From this it is obviously necessary to find what proportion the part immersed bears to the whole, to do which the specific gravity of the floating body must be known, after which it must be found by geometrical method, in what positions the solid can be placed on the surface of the fluid, so that both centres of gravity may be in the same vertical line, when any given part of the solid is immersed under the surface. These things being determined, something is still wanting; for positions may be assumed in which the circumstances now mentioned concur; and yet the solid will assume some other position wherein it will permanently float. However operose and difficult (says the late Mr. English) the calculations necessary to determine the stability of nautical vessels may, in some cases, be, yet they all depend upon the four following simple and obvious theorems, accompanied with other well known stereometrical and statical principles.

Theorem 1. Every floating body displaces a quantity of the fluid in which it floats, equal to its own weight; and consequently, the specific gravity of the fluid will be to that of the floating body, as the magnitude of the whole is to that of the part immersed.

Theorem 2. Every floating body is impelled downward by its own essential power, acting in the direction of a vertical line passing through the centre of gravity of the whole; and is impelled upwards by the re-action of the fluid which supports it, acting in the direction of a vertical line passing through the centre of gravity of the part immersed; therefore, unless these two lines are coincident, the floating body thus impelled must revolve round an axis, either in motion or at rest, until the equilibrium is restored.

Theorem 3. If by any power whatever a vessel be deflected from an upright position, the perpendicular distance between two vertical lines passing through the centres of gravity of the whole, and of the part immersed respectively, will be as the stability of the vessel, and which will be positive, nothing, or negative, according as the metacentre is above, coincident with, or below the centre of gravity of the vessel.

Theorem 4. The common centre of gravity of any system of bodies being given in position, if any one of these bodies be moved from one part of the system to another, the corresponding motion of the common centre of gravity, estimated in any given direction, will be to that of the aforesaid body, estimated in the same direction, as the weight of the body moved is to that of the whole system: From whence it is evident, that in order to ascertain the stability of any vessel, the position of the centres of gravity of the whole, and of that part immersed, must be determined; with which, and the dimensions of the vessel, the line of floatation, and angle of deflection, the stability or power either to right itself or overturn, may be found.

Those who wish to acquaint themselves more minutely with this interesting branch of hydrostatic theory, may consult Mr. Atwood's valuable paper in vol. 80. of the Philosophical Transactions, and chap. 3. book iii. Gregory's Mechanics.

FLO'ATY. *a.* Buoyant and swimming on the surface (*Raleigh*).

FLOCK. *s.* (ꝼlocc, Saxon.) 1. A company; usually a company of birds or beasts (*Shakspeare*). 2. A company of sheep, distinguished from *herds*, which are of oxen (*Addison*). 3. A body of men (*Maccabees*). 4. (from *floccus.*) A lock of wool (*Dryden*).

To FLOCK. *v. n.* (from the noun.) To gather in crowds or large numbers (*Suckling*).

To FLOG. *v. a.* (from *flagrum*, Latin.) To lash; to whip (*Swift*).

FLOOD. *s.* (ꝼloꝺ, Saxon.) 1. A body of water; the sea; a river (*Dryden*). 2. A deluge; an inundation (*Shakspeare*). 3. Flow; flux; the swelling of a river by rain or inland flood (*Davies*). 4. The general deluge (*Br.*). 5. Catamenia (*Harvey*).

To FLOOD. *v. a.* (from the noun.) To deluge; to cover with waters (*Mortimer*).

FLO'ODGATE. *s.* (*flood* and *gate.*) Gate or shutter by which the watercourse is closed or opened at pleasure (*Sidney*).

FLOOK. *s.* (*pflug*, a plough, German.) 1. The broad part of the anchor which takes hold of the ground. 2. A flounder; a flat river fish.

FLOOR. *s.* (ꝼloꞃ, ꝼloꞃe, Saxon.) 1. The pavement: a pavement is always of stone, the floor of wood or stone (*Sidney*). 2. A story; a flight of rooms (*Ben Jonson*).

To FLOOR. *v. a.* (from the noun.) To cover the bottom with a floor (*Chronicles*).

FLOOR, in building, the underside of a room, or that part we walk on. Floors are of several sorts; some of earth, some of brick, others of stone, others of boards, &c. For an account of brick and stone floors, see PAVEMENT. For boarded floors, it is observable, that the carpenters never floor their rooms with boards till the carcase is set up, and also inclosed with walls, lest the weather should injure the flooring. Yet they generally rough-plane their boards for the flooring before they begin any thing else about the building, that they may set them up to dry and season, which is done in the most careful manner. The best wood for flooring is the fine yellow deal well seasoned, which, when well laid, will keep its colour for a long while; whereas the white sort becomes black by often washing, and looks very bad. Floors are measured by squares of 10 feet on each side, so that taking the length and breadth and multiplying them together and cutting off two decimals, the content of a floor in squares will be given. Thus 18 by 16 gives 288 or 2 squares, and 88 decimal parts.

FLOORS (Earthen), are commonly made of loam, and sometimes, especially to make malt on, of lime, and brooksand, and gun-dust, or anvil-dust from the forge. Ox-blood and fine clay tempered together, sir Hugh Plat says, make the finest floor in the world. The floors of the new prisons at Dartmoor are made of gypsum.

Floor of a ship, so much of her bottom as she rests on when aground.

Floor-timbers, in a ship, are those parts of a ship's timbers which are placed immediately across the keel, and upon which the bottom of the ship is framed; to these the upper parts of the timbers are united, being only a continuation of floor-timbers upwards.

Floor, in malting, a name given to the malt when it is spread upon the floor, after it is taken from the cistern. Barley when steeped in the cistern, swells about one-fourth part; it is then called a couch, and bears that name till it has been 30 hours out of the cistern: when it has been out more than 30 hours, it generally sprouts and increases so much as to be double what it was before wetting; it is then called a floor. It is therefore settled by law, that 4 neat bushels shall be reckoned equivalent to 5 couch bushels, or 8 floor bushels.

FLO'ORING. *s.* (from *floor.*) Bottom; pavement (*Addison*).

To FLOP. *v. a.* (from *flap.*) To clap the wings with noise (*L'Estrange*).

FLORA, the goddess of flowers and gardens among the Romans, such as the Chloris of the Greeks. She was worshipped among the Sabines long before the foundation of Rome, and Tatius was the first who raised her a temple in the city of Rome. It is said that she married Zephyrus, and received from him the privileges of presiding over flowers, and of enjoying perpetual youth. She was represented as crowned with flowers, and holding in her hand the horn of plenty.

FLO'RAL. *a.* (*floralis*, Latin.) Relating to Flora, or to flowers (*Prior*).

Floral bud. In botany. Containing the flowers. In opposition to foliate or leafy, containing the leaves. (See Bud.) Floral leaf. Immediately attending the flower, but different from the Bracte, which see.

FLORALIA, games in honour of Flora at Rome. They were instituted about the age of Romulus, but not regularly celebrated until the year U.C. 580. They were observed yearly, and exhibited a scene of the most unbounded licentiousness.

FLO'REN. *s.* A gold coin of Edward III. in value six shillings.

FLO'RENCE. *s.* (from the city *Florence.*) A kind of cloth.

Florence, an ancient, large and celebrated city of Italy, capital of Tuscany. It is a very beautiful city. Exclusive of the churches and palaces, some of which are magnificent, the architecture of the houses in general is in a good taste. The streets are remarkably clean, and paved with large broad stones, chiselled so as to prevent the horses from sliding. This city is divided into two unequal parts by the river Arno, over which are no less than four bridges in sight of each other. That called the Ponte della Trinità is uncommonly elegant. It is built entirely of white marble, and ornamented with four beautiful statues, representing the four seasons. The quays, the buildings on each side, and the bridges, render that part of Florence through which the river runs by far the finest. The streets, squares, and fronts of the palaces, are adorned by a great number of statues; some of them by the best modern masters, Michael Angelo, Bandinelli, Donatello, Giovanni di Bologna, Benvenuto Cellini, and others. Some of the Florentine merchants, formerly, were men of vast wealth, and lived in a magnificent manner. One of them, about the middle of the 15th century, built that noble fabric which from the name of its founder is still called the Palazzo Pitti. He was ruined by the prodigious expence of this building, which was immediately purchased by the Medici family, and has continued ever since to be the residence of the grand dukes of Tuscany. The gardens belonging to this palace are on the declivity of an eminence. On the summit is a kind of a fort, called Belvedere, from which, and some of the higher walks, is a complete view of the city of Florence, and the beautiful vale of Arno, in the middle of which it stands. The prospect is bounded on every side by an amphitheatre of fertile hills, adorned with country-houses and gardens. The Palazzo Pitti is on the opposite side of the Arno from the famous gallery. It has been enlarged since it was purchased from the ruined family of Pitti. The furniture is rich and curious; but the most valuable ornaments are the paintings. The gallery just mentioned attracts universal attention. One of the most interesting parts of it, in the opinion of many, is the series of Roman emperors from Julius Cæsar to Gallienus, which is almost complete. The celebrated Venus of Medici, the standard of taste in female beauty and proportion, is in a room called the Tribunal. The inscription on the pedestal ascribes it to Cleomenes, an Athenian, the son of Apollodorus. It is of white marble, and surrounded by other masterpieces of sculpture, said to be the works of Praxiteles and other Greek masters. Florence is a place of some strength, and contains an archbishop's see, and a university. Lat. 43. 46 N. Lon. 11. 15 E.

FLORENTINE EXPERIMENT, the name given, by way of distinction, to an experiment made by the Academi del Cimento, at Florence; in which water, when violently squeezed, made its way through the fine pores of a hollow sphere of gold, rather than yield to the compression. It was inferred from this experiment, gross and inadequate as it was, that water was incompressible; but our ingenious countryman, Mr. Canton, devised a set of experiments, by which the contrary was satisfactorily shewn. See Phil. Trans. for 1762 and 1764.

FLORENTINO, one of the three provinces into which Tuscany is divided. Its chief town is Florence.

FLORES BENZOES. See BENZOIC ACID.

FLORES SULPHURIS. See SULPHUR.

FLORES SULPHURIS LOTI. When sublimed sulphur is boiled and washed in water, it forms the flores sulphuris loti of the pharmacopœias. Analogous to this preparation is the sulphur precipitatum; they possess eccoprotic, diaphoretic, and antipsorical virtues, and are administered in obstipation where there are piles, colica pictonum, worms, &c. The new name is sulphur lotum.

FLO'RET. s. (*fleurette*, French.) A small imperfect flower.

FLO'RID. a. (*floridus*, Latin.) 1. Productive of flowers; covered with flowers. 2. Flushed with red (*Taylor*). 3. Embellished; splendid (*Dryden*).

FLORID SONG, in music, the same as figurate descant.

FLORID STYLE OF WRITING, is that in which the ornaments are too rich and gaudy in proportion to the subject; when they return upon us too fast, and strike us either with a dazzling lustre or a false brilliancy. In a young author this is pardonable; nay it is often a promising symptom. *Volo se efferat in adolescente fecunditas*, &c. says Quintilian: "In youth I wish to see luxuriancy of fancy. Much of it will be diminished by years; much will be corrected by ripening judgment; some of it by the mere practice of composition, will be worn away. Let there be only sufficient matter at first that can bear some pruning and lopping off. At this time of life let genius be bold and inventive, and pride itself in its efforts, though these should not as yet be correct. Luxuriance can easily be cured; but there is no remedy for barrenness."

FLORID GOTHIC, in architecture, distinguishes itself by an exuberance of decoration, by roofs where the most delicate fret-work is expressed in stone, and by a certain lightness of finishing, as in the roof of the choir at Gloucester, where it is thrown like a web of embroidery over the old Saxon vaulting. Many monumental shrines afford exquisite specimens of this style. We have also a remarkable one in the superb chapel of Henry VII. at Westminster.

FLORIDA, a country of North America, bounded on the N. by Georgia, on the E. by the Atlantic ocean, on the S. by the gulf of Mexico, and on the W. by the Mississippi. It is 600 miles long, and 130 broad, lying between 25 and 31 N. lat. and 82 and 92 W. lon. It is divided into E. and W. Florida. St. Augustine is the capital of the former, and Pensacola of the latter. The country about St. Augustine is by far the most unfruitful; yet even here two crops of Indian corn are annually produced. The banks of the rivers are of a superior quality, and well adapted to the culture of rice and corn. The interior country, which is high and pleasant, abounds with wood of almost every kind; particularly white and red oak, pine, hiccory, cypress, red and white cedar. The intervals between the hilly parts are very rich, and produce spontaneously the fruits common to Georgia and the Carolinas. Florida was discovered by Sebastian Cabot. It now belongs to the Spaniards.

FLORI'DITY. s. (from *florid*.) Freshness of colour (*Floyer*).

FLO'RIDNESS. s. (from *florid*.) 1. Freshness of colour. 2. Embellishment; ambitious elegance (*Boyle*).

FLORI'FEROUS. a. (*florifer*, Lat.) Productive of flowers.

FLORIN, is sometimes used for a coin, and sometimes for a money of account. Florin, as a coin, is of different values, according to the different metals and different countries where it is struck. The gold florins are most of them of a very coarse alloy, some of them not exceeding thirteen or fourteen carats, and none of them seventeen and a half. (See MONEY-TABLE.) Florin, as a money of account, is used by the Italians, Dutch, and Germans: it admits of different divisions in different places.

FLORINIANI, in church history, one of the names given to the Gnostics.

FLORIS (Francis), a painter of Antwerp, born in 1520. He studied the works of Michael Angelo in Italy, and on his return to his own country, became so greatly employed as to acquire a good fortune. He has been called the Flemish Raphael. He died at the age of fifty.

FLO'RIST. s. (*fleuriste*, French.) A cultivator of flowers (*Pope*).

FLO'RULENT. a. (*floris*, Lat.) Flowery; blossoming.

FLORUS (Lucius Annæus), a Latin historian, of the same family as Seneca and Lucan. He wrote an abridgment of the Roman History, in four books, which is concise and elegant, but composed in a florid, poetical style. He flourished A.D. 116. The best editions of Florus are Dicker's, two vols. 8vo. Bat. 1722, and that of Fischer's, 8vo. Leip. 1760.

FLOS (Flower), in botany. See FLOWER.

FLOS ADONIS, in botany. See ADONIS.

FLOSCULAR FLOWER, in botany, a term of Tournefort's, for which Linnéus substitutes tubulous. It is opposed to the semi flosculous—ligulate of Linnéus. See TUBULOUS.

FLOSCULE, in botany. See FLORET.

FLO'SCULOUS. a. (*flosculus*, Lat.) Composed of flowers.

FLOTA, or **FLOTTA**, fleet, a name the Spaniards give particularly to the ships which they send annually from Cadiz to the port of Vera Cruz, to fetch thence the merchandizes gathered in Mexico for Spain.

The name flotilla is given to a number of ships, which get before the rest in their return, and give information of the departure and cargo of the flota and galleons.

To **FLOTE.** v. a. (See *To fleet*.) To skim.

FLO'TSON. s. (from *flote*.) Goods that swim without an owner on the sea.

FLO'TEN. *part.* (from *flote.*) Skimmed.

To **FLOUNCE.** *v. n.* (*plonsen*, Dutch.) 1. To move with violence in the water or mire; to struggle in the water (*Addison*). 2. To move with weight and tumult (*Prior*). 3. To move with passionate agitation (*Swift*).

To Flounce. *v. a.* To deck with flounces.

Flounce. *s.* (from the verb.) Any thing sewed to the garment, and hanging loose, so as to swell and shake (*Pope*).

FLO'UNDER. *s.* (*flynder*, Danish.) A small flat fish. See Pleuronectes.

To Flo'under. *v. n.* (from *flounce.*) To struggle with violent and irregular motions (*Dryden*).

FLOUR, the meal of wheat-corn, finely ground and sifted. Flour, when carefully analyzed, is found to be composed, 1. Of fecula, which is insoluble in cold water, but soluble in hot water. 2. Of gluten. 3 Of a saccharine matter, susceptible of the spirituous fermentation. The grain itself is not only subject to be eaten by insects in that state; but, when ground into flour, it gives birth to another race of destroyers, who eat it unmercifully, and increase so fast in it, that it is not long before they wholly destroy the substance. The finest flour is most liable to breed these, especially when stale or ill prepared. In this case, if it be examined in a good light, it will be observed to be in continual motion, and on a nicer inspection there will be found in it a great number of little animals of the colour of the flour, and very nimble. If a little of this flour is laid on the plate of the double microscope, the insects are very distinctly seen in great numbers, very brisk and lively, continually crawling over one another's backs, and playing a thousand antic tricks together; whether in diversion, or in search of food, is not easy to be determined. These animals are of an oblong and slender form; their heads are furnished with a kind of trunk or hollow tube, by means of which they take in their food, and their body is composed of several rings. They do vast mischief among magazines of flour laid up for armies and other public uses. When they have once taken possession of a parcel of this valuable commodity, it is impossible to drive them out; and they increase so fast, that the only method of preventing the total loss of the parcel is to make it up into bread as soon as can be done. The way to prevent their breeding in the flour is to preserve it from damp: nothing gets more injury by being put up in damp than flour; and yet nothing is more frequently put up so. It should be always carefully and thoroughly dried before it is put up; and the barrels also dried into which it is to be put; then, if they are placed in a room tolerably warm and dry, they will keep it well. Too dry a place never does flour any hurt, though one too moist almost always spoils it.

The proportion of flour, which a bushel of grain affords, greatly varies. A bushel of Essex wheat, Winchester measure, weighs upon an average about 60*lbs.* which, when ground, will yield (exclusive of the loss incurred by the grinding and drying) 45¾*lbs.* of the flour called seconds, which alone is used for baking throughout the greater part of England, and which affords the most wholesome, though not the whitest bread. Beside the seconds, such a bushel of wheat yields 13*lbs.* of pollard and bran: the total loss in grinding seldom exceeds one pound and a half.

Flour-mills are put into motion in various ways: sometimes the first mover is wind, at others water, at others the force of steam, at others the muscular energy of animals. The mechanism of the grinding part of most of these is nearly the same, and well understood: so that it will not be necessary to enter much into minutiæ, but merely to present a general description of a well-constructed mill, with any first mover; and subjoin to this description a few theorems.

A flour-mill of the most improved kind is shewn in Plate 71, which contains two figures, an elevation fig. 1, and a plan fig. 2.

The mill is adapted to be driven by an overshot water-wheel AA, though if the local circumstances of the situation required an undershot-wheel, its place relative to the rest of the machinery would be the same. The water-wheel is suspended by the pivots, inserted into the ends of its axis upon pieces of brass let into short beams, technically termed headstocks: these are firmly bedded upon masonry to give them the requisite stability to support so heavy a piece of machinery as a loaded water-wheel. The headstock B in the plan is placed upon the wall of the pit called the wheel race, in which the water-wheel works: the other C, is supported on a similar wall of the cog-pit within the building, and shewn in the plan by a dark space. In this pit the large iron cog-wheel D, which is fixed upon the axis of the water-wheel, works: it has 72 bevelled cogs fixed into its circumference, by which it turns a small twilled-wheel E, of 19 teeth, fixed upon a vertical iron axis, as is also a large iron spur-wheel F, which, therefore, revolves at the same time, and by its teeth, 72 in number, turns the two pinions or nuts GG, fixed upon the axes of the upper millstones H, between which and the nether or lower stones, I, the wheat or corn is ground.

The millstones are of a cylindric form, as shewn by the section at H, in fig. 1, and by the plan at fig. 3. The upper one has a cylindric hole through it called the eye of the stone; it is supported upon the upper end of its axis by an iron cross; the four ends of which are let into the stone, and the centre of the cross is fitted upon the upper end of the square iron axis, on which the pinion G is fixed. The lower stone I is of a similar figure, but about one inch larger all round than the upper or running stone H; the hole through its centre is not so large, and has a piece of wood let into it, which fits closely round the upper part of the spindle. The two stones are enclosed in a cylindrical tub K, which fits the lower stone: upon the top of this tub a slight frame is erected to support the hopper *d*, which receives the corn to be ground; it has a loose trough *a*, called the shoe, suspended beneath the aperture in its vortex to convey the corn and let it fall into the eye of the millstone. To facilitate the conveyance of the corn, the shoe is continually shaken from one side to the other by a small axis *b*, which is fitted upon the square end of the spindle: the centre of the axis is divided into three small rods, and bent outward from the axis; these three projecting rods successively press against the shoe and move it one way, and it is returned as soon as the rod has passed by, by means of a wooden spring: the outer end of the shoe is suspended by a string *e*, which is conveyed down to the ground floor and wound round a pin which the miller can reach, and by turning it he raises or lowers the shoe so as to regulate the quantity of corn which shall pass through the stones, by enlarging or diminishing the aperture in the lower part of the hopper. A trough of wood is placed, leading from the space between the tub K, and the running stone H, down to a chest which is placed in the house at N, in the plan before the machinery; or in some cases, the mouth of a sack is suspended under this trough to receive the meal. The corn is kept in a store-room over the mill-stones, and by a trough is conveyed into the hopper, and thence it is shaken into the eye of the shoe, and falling between the arms of the iron cross, shewn in fig. 3, it is thrown by the centrifugal force into the small cavities between the two stones IH, their adjacent surfaces being cut into channels, as represented in fig. 3; and the running-stone turning round while the lower one remains fixed, the faces of these channels meet each other, and the corn getting between, is cut or ground into innumerable fragments. The centrifugal force constantly throws the corn or rather meal farther from the centre till at length it comes completely out from the stones into the space between them and the tub K, here it is carried round by the motion of the stone, and falls down through the trough before mentioned into the sack or chest on the ground.

The friction caused in the operation of grinding creates a considerable degree of heat in the flour; and if the velocity of the stone is too great, the flour will be spoiled by causing it to ferment, and turn sour when stowed in sacks. To avoid this the miller must regulate the quantity of water upon his wheel, and also the quantity of corn, by raising or falling the shoe as before described. The fineness of the flour depends upon the distance the stones are from one another; and this is regulated by raising or lowering the upper stone H. For this purpose, the spindle P is supported on a beam O, called the bridge-tree; one end of this *h*, is a centre, and the other slides up and down between two vertical posts seen in the elevation, and the end of it is supported upon a screw, the head of which goes through the floor above. By turning this screw, the miller raises and lowers the bridge-trees O, and sets the stones finer or coarser at pleasure. The flour, after being ground, is dressed or separated from its bran, by the BOLTING-MACHINE. (See that article). This is put in motion by means of a vertical axis placed over the one in the elevation and being a continuation of it, near the cieling of the upper room. It has a bevilled cog-wheel fitted on it, turning another on an horizontal axis, upon which is a pulley driving the bolting-machine by an endless rope or strap. Another pulley on the same axis is usually adapted to move a dressing-machine, which is a cylinder of wire cloth of different degrees of fineness; within it a cylinder covered with hair brushes revolves and drives the meal through the wires, separating it into different degrees of fineness in the same manner as the bolting-machine.

It will not be expected that we should allot much space to the theory of flour-mills, though it may not be adviseable to pass it over entirely. We shall therefore give two or three theorems for a single flour-mill of the common construction, which may be applied with facility, so far as they are useful, to double or triple mills.

Let the weight of the upper stone when furrowed be = W, the resistance of the corn reduced to the distance of the centre of gyration, or at $\frac{2}{3}$ of the radius of the upper stone = R, then, according to Belidor, $R = \frac{W}{35}$, while according to Fabre $R = \frac{W}{23}$. But when the upper stone, to work most advantageously in every respect, goes round 60 times in a minute, we have

$$R = \frac{60}{N} \cdot \frac{2\,W}{35} = \frac{60}{450 \div D} \cdot \frac{2\,W}{35} = \frac{D\,W}{131\frac{1}{4}}$$

This, however, would require an upper mill-stone of about $7\frac{1}{2}$ feet diameter: for when the diameter of that stone is D in feet, and N the most advantageous number of rotations in 1 minute, we have, from many observations, $N = \frac{450}{D}$, as introduced into the preceding theorem; and this, when N = 60, gives $D = 7\frac{1}{2}$.

Let the whole friction when reduced to $\frac{2}{3}$ of the radius of the upper stone be represented by F, and the effective distance of the force or power from the axe on which the stone revolves = *r*, the number of teeth in the first or commanding wheel = M, and the number of staves in the trundle = *m*, the number of revolutions of the water-wheel in 1 minute = *n*, the power which at the distance *r* from the axe of the water-wheel is necessary to retain the whole load in equilibrium = *p*; so shall we have

$$r\,p = \frac{M}{m} \cdot \tfrac{2}{3}\,D\,(R + F)$$

$$\text{whence, } p = \frac{2MD}{3mr}\,(R + F)$$

$$\text{or, because } \frac{M}{m} = \frac{N}{n}$$

$$\text{we have } p = \frac{2ND}{3nr}\,(R + F).$$

Let the time in seconds in which the water-wheel revolves be = *t*, the velocity with which any point in its circumference moves = *v*, the height due to this velocity being = *h*, $\pi = 3{\cdot}141593$, and $g = 16\frac{1}{12}$ feet, then is

$$t = \frac{2\pi r}{v} = \frac{\pi r}{\sqrt{gh}}, \text{ and } n = \frac{60}{t} = \frac{60\sqrt{gh}}{\pi r}$$

$$\text{But it is also } n = \frac{m}{M}N = \frac{m}{M} \cdot \frac{450}{D}$$

$$\text{therefore } \frac{450m}{DM} = \frac{60\sqrt{gh}}{\pi r}, \text{ and } r = \frac{10DM\sqrt{gh}}{450\pi m}$$

An undershot-wheel produces the greatest useful effect, when the height due to the velocity of the impinging water being H, we have $h = \frac{1}{4}H$, or $v : V :: \sqrt{\frac{1}{4}} : 1 :: 2 : 4$ nearly: retaining these as sufficiently exact for practice, the most advantageous radius of the undershot water-wheel, the water pushing against shovels or float-boards, is

$$\rho = \frac{60DM\sqrt{\frac{1}{4}gH}}{450\pi M} = \frac{0{\cdot}019DM\sqrt{gH}}{m}$$

$$\text{or again } \rho = \frac{{\cdot}0101\,DMV}{m},$$

where V is the velocity of the impinging water.

But in undershot-mills the fall is seldom, if ever, more than 15 or 16 feet: in that case the most advantageous position of the work is to have

$$\frac{M}{m} = \frac{122{\cdot}27}{DV}$$

Further, let L = the number of pounds of meal which are produced every hour, s = the specific gravity of the upper mill-stone, that of water being unity, and B the solid content of the stone in cubic feet: the remaining letters having the same acceptation as before: then

for rye and wheat $L = 0{\cdot}021\ D^2\ sB\frac{Mv}{mr}$ pounds.

for old barley $L = 0{\cdot}06\ D^2\ sB\frac{Mv}{mr}$ pounds.

For more on the subject of flour-mills, the reader may consult Brewster's Ferguson, vol. ii. Gray's Millwright, and Gregory's Mechanics, vol. ii.

FLOUR (St.) An episcopal town of France, in the department of Cantal. Here is a manufacture of knives. Lat. 45. 2 N. Lon. 3. 11 E.

To FLO'URISH. *v. n.* (*floreo*, Lat.) 1. To be in vigour; not to fade (*Pope*). 2. To be in a prosperous state (*Dryden*). 3. To use florid language (*Baker*). 4. To describe various figures by intersecting lines (*Pope*). 5. To boast; to brag. 6. (In music.) To play some prelude.

To FLO'URISH. *v. a.* 1. To adorn with vegetable beauty (*Fenton*). 2. To adorn with figures of needlework. 3. To work with a needle into figures (*Bacon*). 4. To move any thing in quick circles or vibrations (*Crashaw*). 5. To adorn with embellishments of language (*Bacon*). 6. To adorn; to embellish (*Shakspeare*).

FLO'URISH. *s.* (from the verb.) 1. Bravery; beauty (*Crashaw*). 2. An ostentatious embellishment; ambitious copiousness (*Bacon. More*). 3. Figures drawn by lines curiously or wantonly drawn (*Boyle*).

FLOURISH, in music, an appellation given to the decorative notes which a singer or instrumental performer adds to a passage, with the double view of heightening the effect of the composition, and of displaying his own flexibility of voice or finger. There is nothing of which a sensible performer will be more cautious than of the introduction of flourishes, because he is never so much in danger of mistaking, as when he attempts to improve his author's ideas. See Busby's Mus. Dict.

FLO'URISHER. *s.* (from *flourish.*) One that is in prime or in prosperity (*Chapman*).

To FLOUT. *v. a.* (*fluyten*, Dutch.) To mock; to insult; to treat with mockery and contempt (*Walton*).

To FLOUT. *v. n.* To practise mockery; to behave with contempt; to sneer (*Swift*).

FLOUT. *s.* (from the verb.) A mock; an insult; a word or act of contempt (*Calamy*).

FLO'UTER. *s.* (from *flout.*) One who jeers.

To FLOW. *v. n.* (ꝼlopan, Saxon.) 1. To run or spread as water (*Swift*). 2. To run: opposed to standing waters (*Dryden*). 3. To rise; not to ebb (*Shakspeare*). 4. To melt (*Isaiah*). 5. To proceed; to issue (*South*). 6. To glide smoothly without asperity (*Hakewill*). 7. To write smoothly; to speak volubly (*Dryden*). 8. To abound; to be crowded (*Chapman*). 9. To be copious; to be full (*Pope*). 10. To hang loose and waving (*Spectator*).

To FLOW. *v. a.* To overflow; to deluge (*Mortimer*).

FLOW. *s.* (from the verb.) 1. The rise of water; not the ebb (*Brown*). 2. A sudden plenty or abundance (*Pope*). 3. A stream of diction (*South*).

FLO'WER. *s.* (*fleur*, French.) 1. The part of a plant which contains the seeds (*Cowley*). 2. An ornament; an embellishment (*Hakewill*). 3. The prime; the flourishing part (*Pope*). 4. The edible part of corn; the meal (*Spenser*). 5. The most excellent or valuable part of any thing; quintessence (*Addison*).

FLOWER, in botany, the organs of generation in vegetables, with their coverings. A flower, when complete, consists of a calyx, stamen, and pistil; but the essential parts are the anther and stigma, which are sufficient to constitute a flower, either together in hermaphrodite flowers, or separate in male and female flowers.

FLOWER-STALK. See PEDUNCLE.

FLOWER (Gentle), in botany. See AMARYLLIS.

FLOWER OF AN HOUR, in botany. See HIBISCUS.

FLOWER DE LUCE, in botany. See IRIS.

FLOWER (Bastard), in botany. See ADENANTHERA.

FLOWER (Eternal), in botany. See XERANTHEMUM.

FLOWER (Sun), in botany. See HELIANTHUS.

FLOWER (Sultan), in botany. See CYANUS.

FLOWER (Trumpet), in botany. See BIGNONIA.

FLOWER (Wind), in botany. See ANEMONE.

FLOWER OF THE CAPITAL, is an ornament of sculpture, in form of a rose, in the middle of the sweep of the Corinthian abacus.

To FLO'WER. *v. n.* (*fleurir*, French.) 1. To be in flower; to bloom (*Milton*). 2. To be in the prime; to flourish (*Spenser*). 3. To froth; to ferment; to mantle (*Bacon*). 4. To come as cream from the surface (*Milton*).

To FLO'WER. *v. a.* (from the noun.) To adorn with fictitious or imitated flowers.

FLOWERS, a term formerly applied by chemists to the fine parts which are sublimated from certain bodies, as the flowers of benjamin, sulphur, zinc, &c. See BENZOIC ACID, &c.

FLOWERS (Geometrical), figures which are curved like a number of leaves expanding from one centre, returning regularly from the circumscribing perimeter. These flowers are commonly named from the number of their leaves, *folios, trifolios, tetrafolios, pentafolios, hexafolios*. &c. The properties of some of these are investigated under the name of Rhodonean curves, in *Phil. Trans.* No. 378.

FLOWERS (Blumen Germ.), in chemistry, a term now becoming obsolete, to denote several substances, both metallic and otherwise, procured by sublimation in the form of slightly cohering powder, or spicular crystals. Thus we find mention made of flowers of antimony, arsenic, zinc, and bismuth, which are the sublimed oxyds of these metals, either pure or combined with a little sulphur or muriatic acid; we also find mention made of flowers of sulphur, of benzoin, and of sal-ammoniac.

FLOWERS (Preserving of). The method of preserving flowers in their natural beauties through the whole year has been much sought after by many people. Some have attempted it by gathering them when dry, and not too much opened, and burying them in dry sand; but this, though it preserves their figure well, takes off from the liveliness of their colour. Muntingius prefers the following method to all others. Gather roses, or other flowers, when they are not yet thoroughly open, in the middle of a dry day; put them into a good earthen vessel glazed within; fill the vessel up to the top with them; and, when full, sprinkle them over with some good French wine, with a little salt in it; then set them by in a cellar, tying down the mouth of the pot. After this they may be taken out at pleasure; and on setting them in the sun, or within reach of the fire, they will open as if growing naturally; and not only the colour, but the odour also, will be preserved.

The flowers of plants are by much the most difficult parts to preserve in any tolerable degree of perfection; of which we have instances in all the collections of dried plants, or horti sicci. In these the leaves, stalks, roots, and seeds of the plants, appear very well preserved; the strong texture of these parts making them always retain their natural form, and the colours in many species naturally remaining. But where these fade, the plant is little the worse for use as to knowing the species. But it is very much otherwise in regard to the petals: these are naturally by much the most beautiful parts of the plant to which they belong; but they are so much injured in the common way of drying, that they not only lose, but change their colours into one another, by which means they give occasion to many errors; and they usually also wither up, so as to lose their very form and natural shape. The primrose and cowslip kinds are very eminent instances of the change of colours in the flowers of dried specimens: for those of this class of plants easily dry in their natural shape; but they lose their yellow, and, instead of it, acquire a fine green colour, much superior to that of the leaves in their most perfect state. The flowers of all the violet kind lose their beautiful blue, and become of a dead white: so that in dried specimens there is no difference between the blue-flowered violet and the white-flowered kinds.

Sir Robert Southwell has communicated to the world a method of drying plants, by which this defect is proposed to be in a great measure remedied, and all flowers preserved in their natural shape, and many in their natural colours. For this purpose, two plates of iron are to be prepared of the size of a large half-sheet of paper, or larger for particular occasions: these plates must be made so thick as not to be apt to bend; and there must be a hole made near every corner for the receiving a screw to fasten them close together. When these plates are prepared, lay in readiness several sheets of paper, and then gather the plants with their flowers when they are quite perfect. Let this be always done in the middle of a dry day; and then lay the plant and its flower on one of the sheets of paper doubled in half, spreading out all the leaves and petals as nicely as possible. If the stalk is thick, it must be pared or cut in half, so that it may lie flat; and if it is woody, it may be peeled, and only the bark left. When the plant is thus expanded, lay round about it some loose leaves and petals of the flower, which may serve to complete any part that is deficient. When all is thus prepared, lay several sheets of paper over the plant, and as many under it; then put the whole between the iron plates, laying the papers smoothly on one, and laying the other evenly over them: screw them close, and put them into an oven after the bread is drawn, and let them lie there two hours. After that, make a mixture of equal parts of aquafortis and common brandy; shake these well together, and when the flowers are taken out of the pressure of the plates, rub them lightly over with a camel's-hair pencil dipped in this liquor; then lay them upon fresh brown paper, and covering them with some other sheets, press them between this and other papers with a handkerchief till the wet of these liquors is dried wholly away. When the plant is thus far prepared, take the bulk of a nutmeg of gum-dragon; put this into a pint of fair water cold, and let it stand twenty-four hours, it will in this time be wholly dissolved; then dip a fine hair-pencil in this liquor, and with it daub over the back sides of the leaves, and lay them carefully down on a half-sheet of white paper fairly expanded, and press them down with some more papers over these. When the gum-water is fixed, let the pressure and papers be removed, and the whole work is finished. The leaves retain their verdure in this case, and the flowers usually keep their natural colours. Some care, however, must be taken that the heat of the oven be not too great. When the flowers are thick and bulky, some art may be used to pare off their backs, and dispose the petals in a due order; and after this, if any of them are wanting, their places may be supplied with some of the supernumerary ones dried on purpose; and if any of them are only faded, it will be prudent to take them away, and lay down others in their stead: the leaves may be also disposed and mended in the same manner.

Another method of preserving both flowers and fruit sound throughout the whole year is also given by the same author. Take saltpetre, one pound; armenian bole, two pounds; clean common sand, three pounds. Mix all well together; then gather fruit of any kind that is not fully ripe, with the stalk to each; put these, one by one, into a wide-mouthed glass, laying them in good order. Tie over the top with an oil-cloth, and carry them into a dry cellar, and set the whole upon a bed of the prepared matter of four inches thick in a box. Fill up the remainder of the box with the same preparation; and let it be four inches thick all over the top of the glass, and all round its sides. Flowers are to be preserved in the same sort of glasses, and in the same manner; and they may be taken up after a whole year as plump and fair as when they were buried.

Flower de lis, or Flower de luce, (*fleur de lis*), in heraldry, a bearing representing the lily, called the queen of flowers, and the true hieroglyphic of royal majesty; but of late it is become more common, being borne in some coats one, in others three, in others five, and in some semee, or spread all over the escutcheon in great numbers. The arms of France are, three flower-de-lis, or, in a field azure. It is observed by antiquarians, that flower de Louis is the proper name, having been borne by St. Louis on his shield, and that it is not a lily but an iris.

FLOWER'AGE. *s.* (from *flower.*) Store of flowers.

FLO'WERET. *s.* (*fleuret*, Fr.) A flower; a small flower (*Dryden*).

FLO'WERGARDEN. *s.* (*flower* and *garden.*) A garden in which flowers are principally cultivated (*Mortimer*).

FLO'WERINESS. *s.* (from *flowery.*) 1. The state of abounding in flowers. 2. Floridness of speech.

FLO'WERINGBUSH. *s.* A plant.

FLO'WERY. *a.* (from *flower.*) Full of flowers; adorned with flowers real or fictitious (*Milton*).

FLO'WINGLY. *ad.* (from *flow.*) With volubility; With abundance.

FLOWK. *s.* (*fluke*, Scott.) A flounder (*Carew*).

FLO'WKWORT. *s.* A plant.

FLOWN. The participle of *fly*. 1. Gone away (*Prior*). 2. Puffed; inflated; elate (*Milton*).

FLUAT. In chemistry, a compound salt, formed by the union of Fluoric acid (which see) with any alkaline or salifiable base. Our knowledge of this genus of salts is as yet very imperfect, both because few experiments have been made on the subject, and because the acid employed has never been pure, but always more or less combined with silica, by which its effect in many instances is very materially modified.

The following are the fluats at present known:

1. Fluat of Potash
2. .... Soda
3. .... Ammonia
4. .... Lime
5. .... Baryte
6. .... Magnesia
7. .... Alumine
8. .... Silex

The first three, or those composed of a base of alkaline salts, are produced by a mixture of such base salts with fluor spar, or with fluoric acid. If the spar be employed, the potash should be caustic potash, the soda carbonat of soda; the ammonia sulphat of ammonia.

Fluat of lime is nothing more than fluor spar prepared artificially, the latter name being usually restricted to this salt in its natural state. It is obtained by adding lime-water, or a solution of any calcareous salt, to any other of the fluats, except perhaps fluat of magnesia; but the purest regenerated fluor is prepared by adding fluat of ammonia to nitrat of lime, the fluat of lime falls to the bottom, and when properly edulcorated, is in all probability entirely pure.

Fluat of baryte is prepared by adding fluoric acid, or, which is better, an alkaline fluat to nitrat or muriat of baryte; the fluat is precipitated in a pulverulent form.

Fluat of magnesia is obtained by adding carbonat of magnesia to fluoric acid; and fluat of alumine, by adding to it the earth of alum.

Fluat of silex. When fluoric acid is prepared by the usual process in glass vessels, it dissolves a portion both of the earth and alkali of which they are formed, and produces a gelatinous fluid, which is thus denominated. Felspar, and perhaps all minerals that contain silex and potash, are acted upon in the same manner. Opal has no alkali, and is attacked with considerable difficulty.

FLU'CTUANT. *a.* (*fluctuans*, Latin.) Wavering; uncertain (*L'Estrange*).

To FLU'CTUATE. *v. n.* (*fluctuo*, Latin.) 1. To roll to and again, as water in agitation (*Blackmore*). 2. To float backward and forward. 3. To move with uncertain and hasty motion (*Milton*). 4. To be in an uncertain state (*Addison*). 5. To be irresolute; to be undetermined.

FLUCTUA'TION. *s.* (*fluctuatio*, Latin.) 1. The alternate motion of the water (*Brown*). 2. Uncertainty; indetermination (*Boyle*).

Fluctuation. A term often used by surgeons to express the undulation of a fluid; thus when pus is formed in an abscess, or when water accumulates in the abdomen, if the abscess or abdomen be lightly pressed with the fingers, the motion of fluctuation may be distinctly felt.

FLUE. *s.* 1. A small pipe or chimney to convey air. 2. Soft down or fur.

FLUE'LLIN. *s.* The herb speedwell. See Elatine.

FLU'ENCY. *s.* (from *fluent.*) 1. The quality of flowing; smoothness; freedom from harshness or asperity (*Garth*). 2. Readiness; copiousness; volubility (*King Charles*). 3. Affluence; abundance; obsolete (*Sandys*).

FLU'ENT. *a.* (*fluens*, Latin.) 1. Liquid (*Bacon*). 2. Flowing; in motion; in flux (*Ray*). 3. Ready; copious; voluble (*Bacon*).

Fluent. *s.* Stream; running water (*Philips*).

Fluent, or flowing quantity, in the doctrine of fluxions, is the variable quantity which is considered as increasing or decreasing; or the fluent of a given fluxion, is that quantity whose fluxion being taken, according to the rules of that doctrine, shall be the same with the given fluxion. See FLUXIONS.

FLUENTS (Contemporary), are such as flow together, or for the same time. And the same is to be understood of contemporary fluxions. When contemporary fluents are always equal, or in any constant ratio, then also are their fluxions respectively either equal, or in that same constant ratio. That is, if $x = y$, then is $\dot{x} = \dot{y}$; or if $x : y :: n : 1$. then is $\dot{x} : \dot{y} :: n : 1$; or if $x = ny$, then is $\dot{x} = n\dot{y}$.

FLU'ENTLY. *ad.* With ready flow; volubly; readily.

FLU'ID. *a.* (*fluidus*, Latin; *fluide*, French.) Having parts easily separable; not solid (*Newton*.)

FLUID, is the name given to a body whose moleculæ have so little mutual adherence that they yield to the slightest pressure, and slide or roll with the greatest facility one over another. A fluid adapts itself in every respect to the vessel which contains it.

Among the fluids presented to us by nature, some cannot be sensibly compressed by known means: these are called liquids, or incompressible fluids. Others are extremely compressible, but impalpable and invisible: these are named elastic, or compressible, or aëriform fluids; and sometimes, indeed, simply fluids.

The physical nature, laws, and effects of incompressible fluids, at rest, and in motion, are referred to the branch of science called HYDROSTATICS, and HYDRODYNAMICS, or HYDRAULICS: those that relate to aëriform fluids appertain to PNEUMATICS.

Most, if not all bodies, may be made to assume three different states, according to the temperature in which they are placed,—solidity, liquidity, and aëriform fluidity. In one substance this is exhibited in the three states of ice, water, and elastic vapour.

FLUID (Calorific). See CALORIC.

FLUID (Electric). See ELECTRICITY.

FLUID (Luminous). See LIGHT.

FLUID (Magnetic). See MAGNETISM.

FLUIDS OF THE BODY. The drying of any part of the human body demonstrates, that by far the greater part consists of fluid. The quantity of fluid in a man of one hundred and sixty pounds weight is estimated at one hundred and thirty-five pounds. The fluids of the human body are divided into, 1. Crude, or those which have not yet put on the animal nature, as the chyme and chyle; 2. Sanguineous, to this is referred the blood, or the cruor of the blood; 3. Lymphatic, which are those of the lymphatic vessels, and the nutritious jelly; 4. Secreted, to this head are referred all those separated from the blood, which are very numerous; 5. Excrementitious, which are eliminated from the body, as the alvine fæces, urine, cutaneous and pulmonary perspirable matter.

The secreted humours are divided into, 1. Lacteal, which are white, as the milk, juice of the prostate and thymus glands; 2. Aqueous as the aqueous humour of the eye; 3. Mucous, as the mucous of the nostrils and primæ viæ; 4. Albuminous, as the serum of the blood; 5. Oleous, as the oil of the adipose membrane; 6. Bilious, as the bile and wax of the ears.

The fluids of the human body are also divided from their motion into, 1. Circulating, which continually circulate in the vessels; 2. Commorant, which circulate with a slow motion, as the oil of the adipose membrane, and male semen: 3. Stagnant, which remain for a certain time in any receptacle, as cystic bile, urine, and the alvine fæces.

FLUIDITY, a property in virtue of which the particles of a body yield to the least pressure, and move independently of one another.

Fluidity in bodies is an accidental and variable property; being due to the presence of caloric. It would seem that the moleculæ of fluids are spherical; but this form is as accidental to the particles of fluids, as the fluidity itself: at least, this is probable. But our knowledge on this point is very circumscribed; and much remains to be done and to be discovered before any thing can be affirmed with certainty and confidence.

All solid bodies, a very small number excepted, may be converted into liquids by heating them sufficiently, and on the other hand, every liquid, except spirit of wine, is convertible into a solid body, by exposing it to a sufficient degree of cold. All liquid bodies may, by heating them, be converted into elastic fluids, and a great many solids are capable of undergoing the same change; and, lastly, the number of elastic fluids which by cold are condensible into liquids or solids, is by no means inconsiderable. These facts have led philosophers to this general conclusion, "that all bodies, if placed in a temperature sufficiently low, would assume a solid form; that all solids become liquids when sufficiently heated; and that all liquids, when exposed to a certain temperature, assume the form of elastic fluids." The state of bodies then depends upon the temperature in which they are placed; in the lowest temperatures they are all solid, in higher temperatures they are converted into liquids, and in the highest of all they become elastic fluids. The particular temperatures at which bodies undergo those changes are exceedingly various, but they are always constant for the same bodies. Thus we see that heat produces changes on the state of bodies, converting them all, first into liquids, and then into elastic fluids.

When solid bodies are converted by heat into liquids, the change in some cases take place at once. There is no interval between solidity and liquidity: but in other cases a very gradual change may be perceived; the solid becomes first soft, and it passes slowly through all the degrees of softness, till at last it becomes perfectly fluid. The conversion of ice into water is an instance of the first change, for in that substance there is no intervening state between solidity and fluidity. The melting of glass, of wax, and of tallow, exhibits instances of the second kind of change; for these bodies pass through every possible degree of softness before they terminate in perfect fluidity. In general, those solid bodies which crystallize or assume regular prismatic figures have no interval between solidity and fluidity, while those that do not usually assume such shapes have the property of appearing successively in all intermediate states.

Solid bodies never begin to assume a liquid form till they are heated to a certain temperature; this temperature is constant in all. In the first class of bodies it is very well defined; but in the second, though it is equally constant, the exact temperature of fluidity cannot be pointed out with such precision on account of the infinite number of shades of softness through which the bodies pass before they acquire their greatest possible fluidity. But even in these bodies we can easily ascertain that the same temperature always produces the same degree of fluidity. The temperatures at which this change from solidity to liquidity takes place, receive different names according to the usual state of the body thus changed. When the body is usually observed in a liquid state, we call the temperature at which it assumes the form of a solid, its freezing point, or congealing point. Thus the temperature in which water becomes ice, is called the freezing point of water: on the other hand, when the body is usually in the state of a solid, we call the temperature at which it liquifies its melting point: thus 212° is the melting point of sulphur, 442° the melting point of tin.

The following table contains a list of the melting points of a considerable number of solid bodies:

Substances.	Melting point.
Lead	594°
Bismuth	576
Tin	442
Sulphur	212
Wax	142
Spermaceti	133
Phosphorus	100
Tallow	92
Oil of anise	50
Olive-oil	36
Ice	32
Milk	30
Vinegar	28
Blood	25
Oil of bergamot	23
Wines	20
Oil of turpentine	14
Sulphuric acid	36
Mercury	39
Liquid ammonia	46
Ether	46
Nitric acid	66.

Before Dr. Black began to deliver his chemical lectures in Glasgow, in 1757, it was universally supposed that solids were converted into liquids by a small addition of heat, after they had been once raised to the melting point, and that they returned again to the solid state on a very small diminution of the quantity of heat necessary to keep them at that temperature. An attentive view of the phenomena of liquefaction and solidification gradually led this sagacious philosopher to observe their inconsistence with the then received opinions, and to form another, which he verified by direct experiments, and drew up an account of his theory, and the proofs of it, which was read to a literary society in Glasgow, on April 23, 1762; and every year after he gave a detailed account of the whole doctrine in his lectures.

The opinion which he formed was, that when a solid body is converted into a liquid, a much greater quantity of heat enters into it than is perceptible immediately after by the thermometer. This great quantity of heat does not make the body apparently warmer, but it must be thrown into it in order to convert it into a liquid; and this great addition of heat is the principal and most immediate cause of the fluidity induced. On the other hand, when a liquid body assumes the form of a solid, a very great quantity of heat leaves it without sensibly diminishing its temperature; and the state of solidity cannot be induced without the abstraction of this great quantity of heat. Or, in other words, whenever a solid is converted into a fluid, it combines with a certain dose of caloric, without any augmentation of its temperature; and it is this dose of caloric which occasions the change of the solid into a fluid. When the fluid is converted again into a solid, the dose of caloric leaves it, without any diminution of its temperature; and it is this abstraction which occasions the change. Thus the combination of a certain dose of caloric with ice causes it to become water, and the abstraction of a certain dose of caloric from water causes it to become ice. Water then is a compound of ice and caloric; and in general all fluids are combinations of the solid, to which they may be converted by the application of cold, and a certain dose of caloric.

Dr. Black has rendered it exceedingly probable also, that the softness of such bodies as are rendered plastic by heat, depends upon a quantity of latent heat which combines with them. Metals also owe their malleability and ductility to the same cause. Hence the reason why they become hot and brittle when hammered.

Thus it appears, that the conversion of solids into liquids is occasioned by the combination of a dose of caloric with the solid. But there is another change of state still more remarkable, to which bodies are liable when exposed to the action of heat. Almost all liquids, when raised to a certain temperature, gradually assume the form of an elastic fluid, invisible like air, and possessed of the same mechanical properties. Thus water, by boiling, is converted into steam, an invisible fluid, 1800 times more bulky than water, and as elastic as air. These fluids retain their elastic form as long as their temperature remains sufficiently high; but when cooled down again, they lose that form, and are converted into liquids. All liquids, and even a considerable number of solids, are capable of undergoing this change when sufficiently heated.

By the experiments of Dr. Black and his friends, it was ascertained that not only water, but all other liquids, during their conversion into vapour, combine with a dose of caloric, without any change of temperature; and that every kind of elastic fluid during its conversion into a liquid, gives out a portion of caloric without any change of temperature. Dr Black's law then is very general, and comprehends every change in the state of a body. The cause of the conversion of a solid into a liquid is the combination of the solid with caloric; that of the conversion of a liquid into an elastic fluid is the combination of the liquid with caloric. Liquids are solids combined with caloric; elastic fluids are liquids combined with caloric. This law, in its most general form, may be stated as follows: whenever a body changes its state, it either combines with caloric, or separates from caloric.

No person will dispute that this is one of the most important discoveries hitherto made in philosophy. Science is indebted for it entirely to the sagacity of Dr. Black. Other philosophers indeed have laid claim to it; but these claims are either without any foundation, or their notions may be traced to Dr. Black's lectures, as their opinions originated many years posterior to the public explanation of Dr. Black's theory in the chemical chairs of Glasgow and Edinburgh.

A very considerable number of bodies both solids and liquids, may be converted into elastic fluids by heat; and as long as the temperature continues sufficiently high they retain all the mechanical properties of gasseous bodies.

It is exceedingly probable, that if we could command a heat sufficiently intense, the same change might be produced on all bodies in nature. This accordingly is the opinion at present admitted by philosophers. But if all bodies are convertible into elastic fluids by heat, it is exceedingly probable that all elastic fluids in their turn might be converted into solids or liquids, if we could expose them to a sufficiently low temperature. In that case, all the gasses must be supposed to owe their elasticity to a certain dose of caloric: they must be considered as compounds of caloric with a solid or liquid body. This opinion was first stated by Amontons, and it was supported with much ingenuity both by Dr. Black and Lavoisier, and his associates. It is at present the prevailing opinion; and it is certainly supported not only by analogy, but by several very striking facts.

If its truth is admitted, we must consider all the gasses as capable of losing their elasticity by depriving them of their heat: they differ merely from the vapours in the great cold which is necessary to produce this change. Now the fact is, that several of the gasses may be condensed into liquids by lowering their temperatures. Oxymuriatic acid gass becomes liquid at a temperature not much under 40°; and at 32° it even forms solid crystals. Ammoniacal gass condenses into a liquid at 45°. None of the other gasses have been hitherto condensed.

It is well known, that the condensation of vapours is greatly assisted by pressure; but the effect of pressure diminishes as the temperature of vapours increases. It is very likely that pressure would also contribute to assist the condensation of gasses. It has been tried without effect indeed in several of them. Thus air has been condensed till it was heavier than water: yet it showed no disposition to lose its elasticity. But this may be ascribed to the high temperature at which the experiment was made relative to the point at which air would lose its elasticity.

At the same time it cannot be denied, that there are several phenomena scarcely reconcileable to this constitution of the gasses, ingenious and plausible as it is. One of the most striking is the sudden solidification which ensues when certain gasses are mixed together. Thus when ammoniacal gass and muriatic acid gass are mixed, the product is a salt acid; yet the heat evolved is very inconsiderable, if we compare it with the difficulty of condensing these gasses separately, and the great cold which they endure before losing their elasticity. In other cases too, gasseous bodies unite, and form a new gass, which retains its elasticity as powerfully as ever. Thus oxygen gass and nitrous gass combined form a new gass, namely, nitric acid, which is permanent till it comes into contact with some body on which it can act. (*Gregory*, *Libes*, *Robison*.)

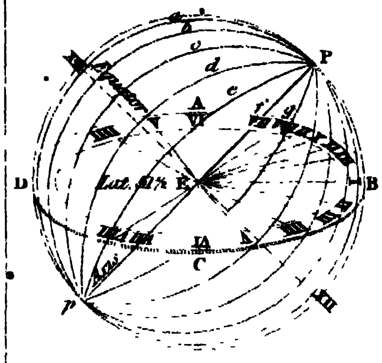
FLUIDNESS. *s.* (from *fluid.*) The quality in bodies opposite to solidity (*Newton*).

END OF THE FOURTH VOLUME.

T. DAVISON, Whitefriars,
London.

DIALING.

Fig. 1.



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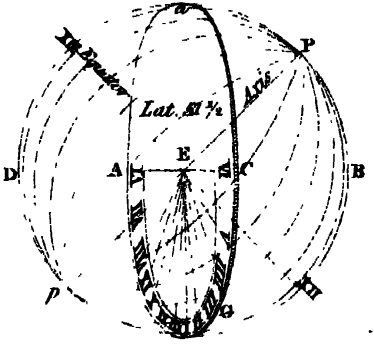

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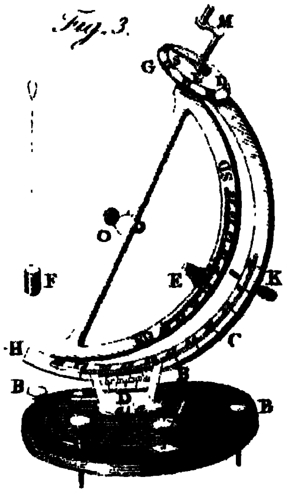

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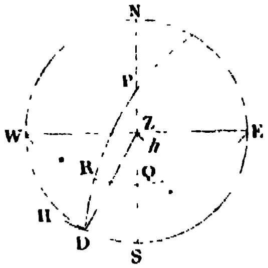

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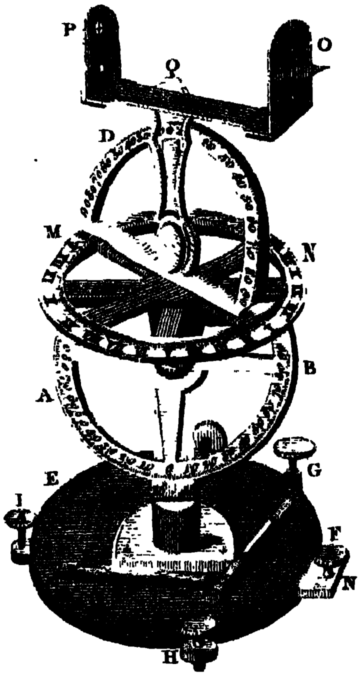

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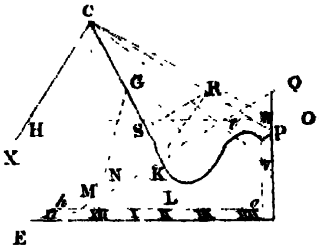

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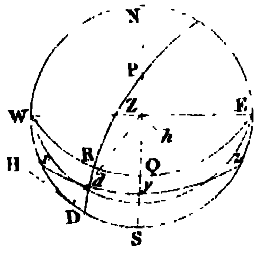

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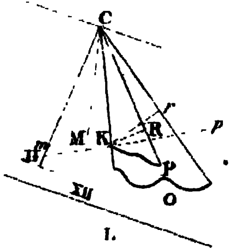


Fig. 10.

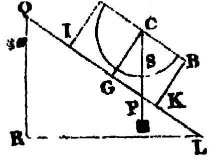
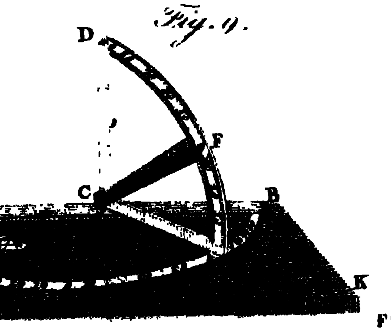
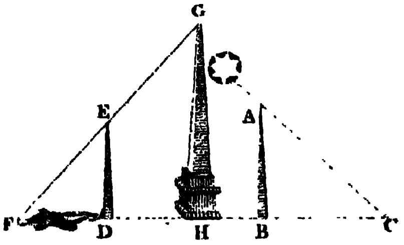


Fig. 9.



Gnomon



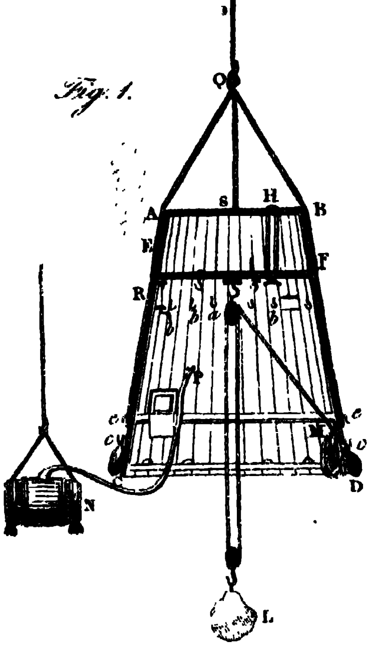
Mutlow Sc. Rusl. Ct. St.

Published by G. Kearsley, Fleet Street, Aug 1st 1809.

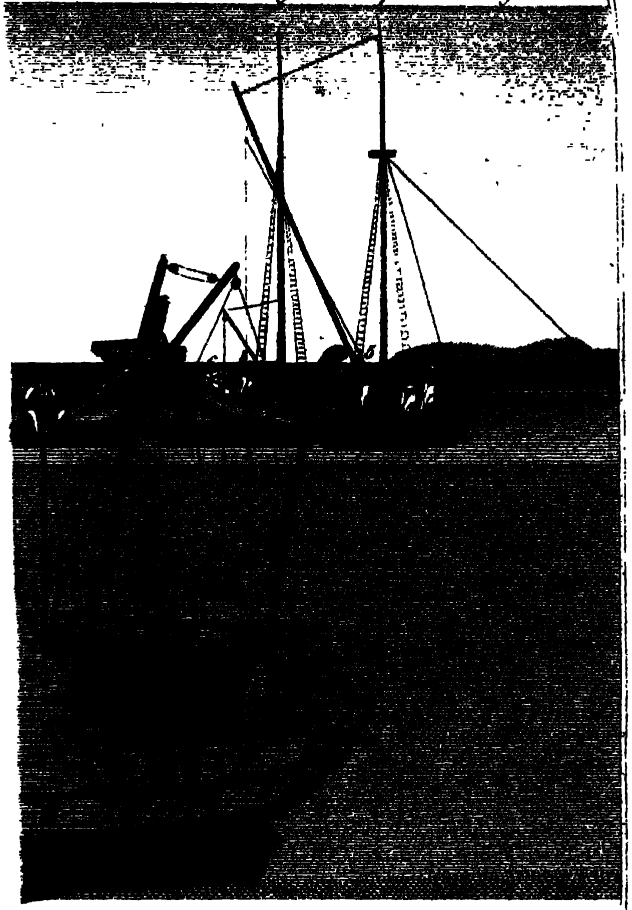
DIVING BELLS. PL. 58.

Spalding's Diving Bell.

Fig: 1.



Apparatus used in recovering property lost in the Abergavenny. Fig. 2.



Walker's Diving Bell.

Fig 3.

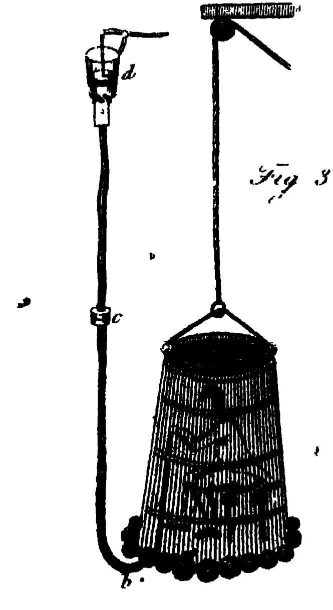
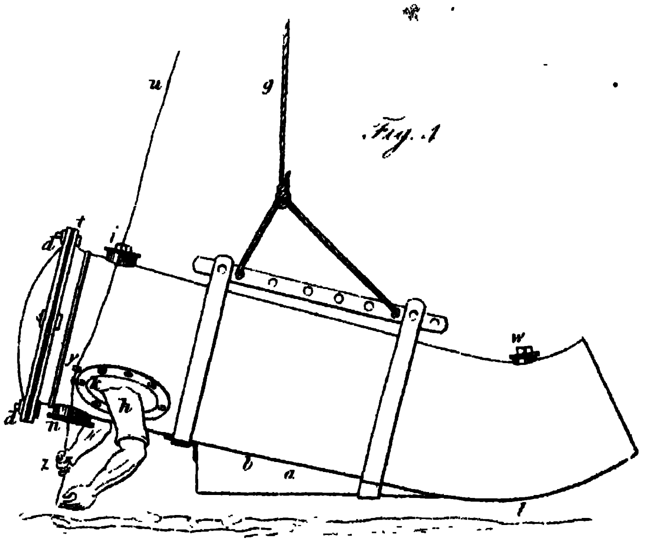
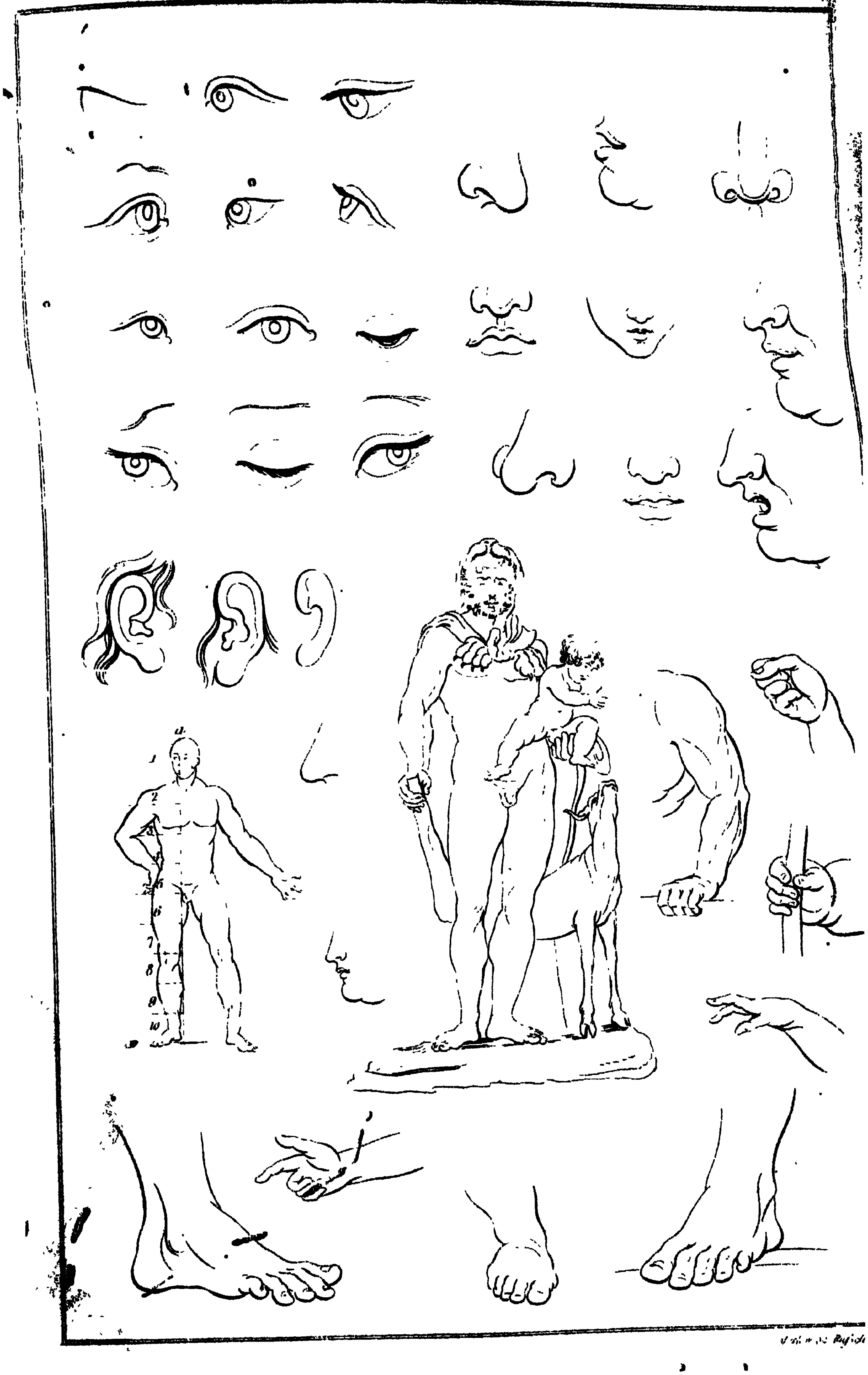


Fig. 4



Mutlow Sc. Russell Ct.

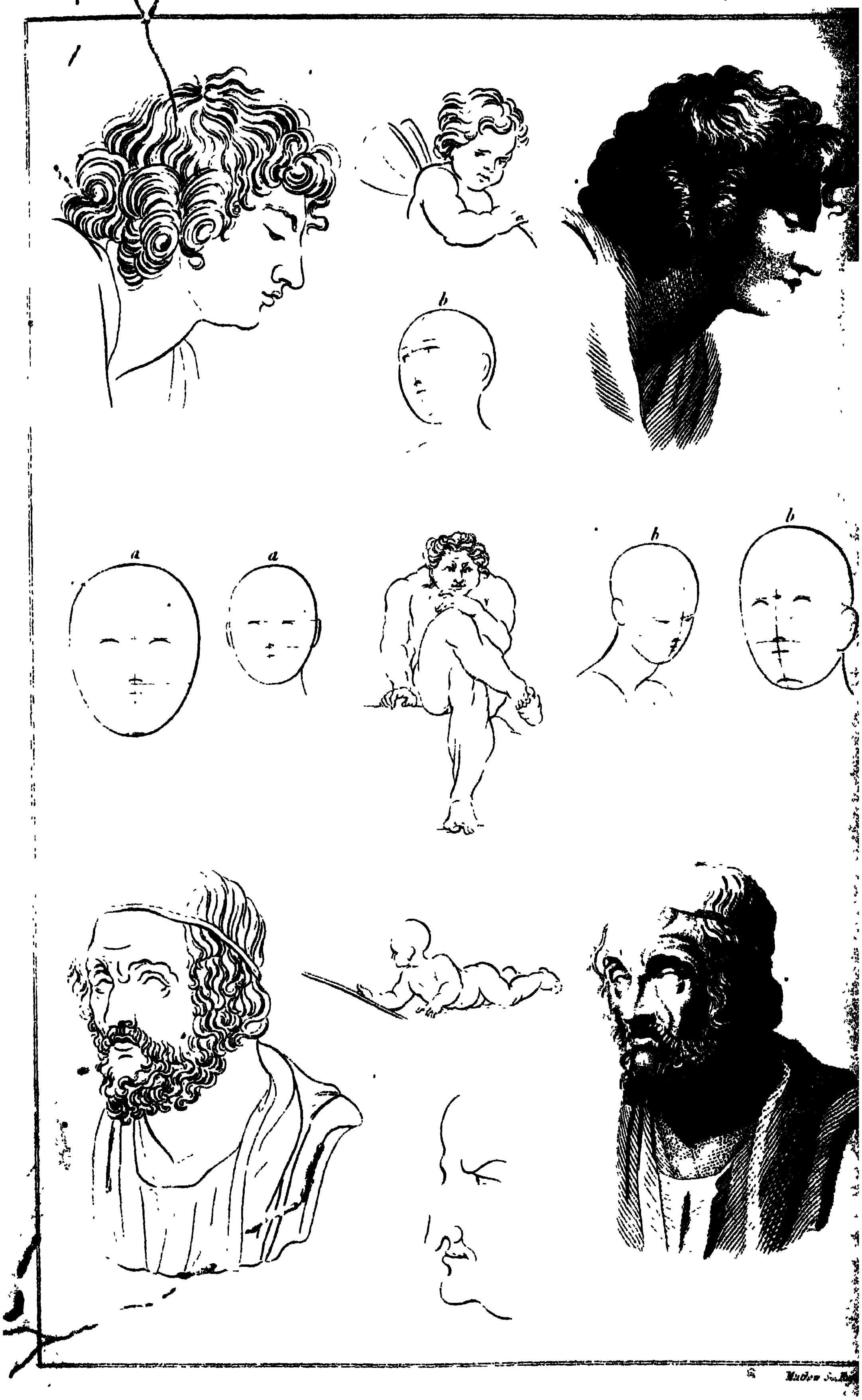
Published by G. Kearsley Fleet Street July 1st 1809



[illegible] sc. Ruſsell

Published by G. Kearsley, Fleet Street, Nov^r 1^st 1809

DRAWING.



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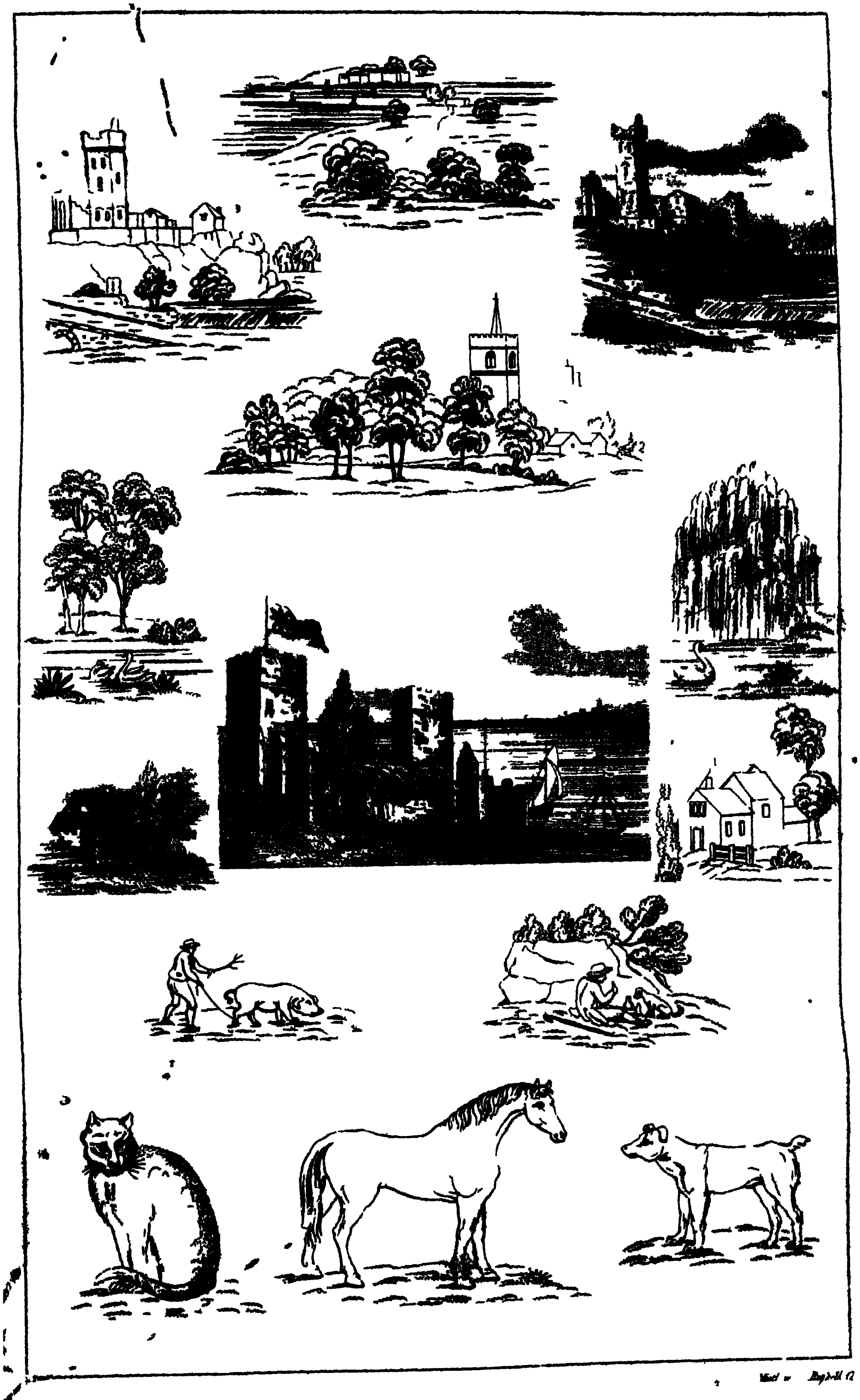

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Pub. [illegible] 1807

Painted by Raphael

Engraved by Mellon Eng.

PAUL PREACHING AT ATHENS

DRAWING.

Pl. 66.

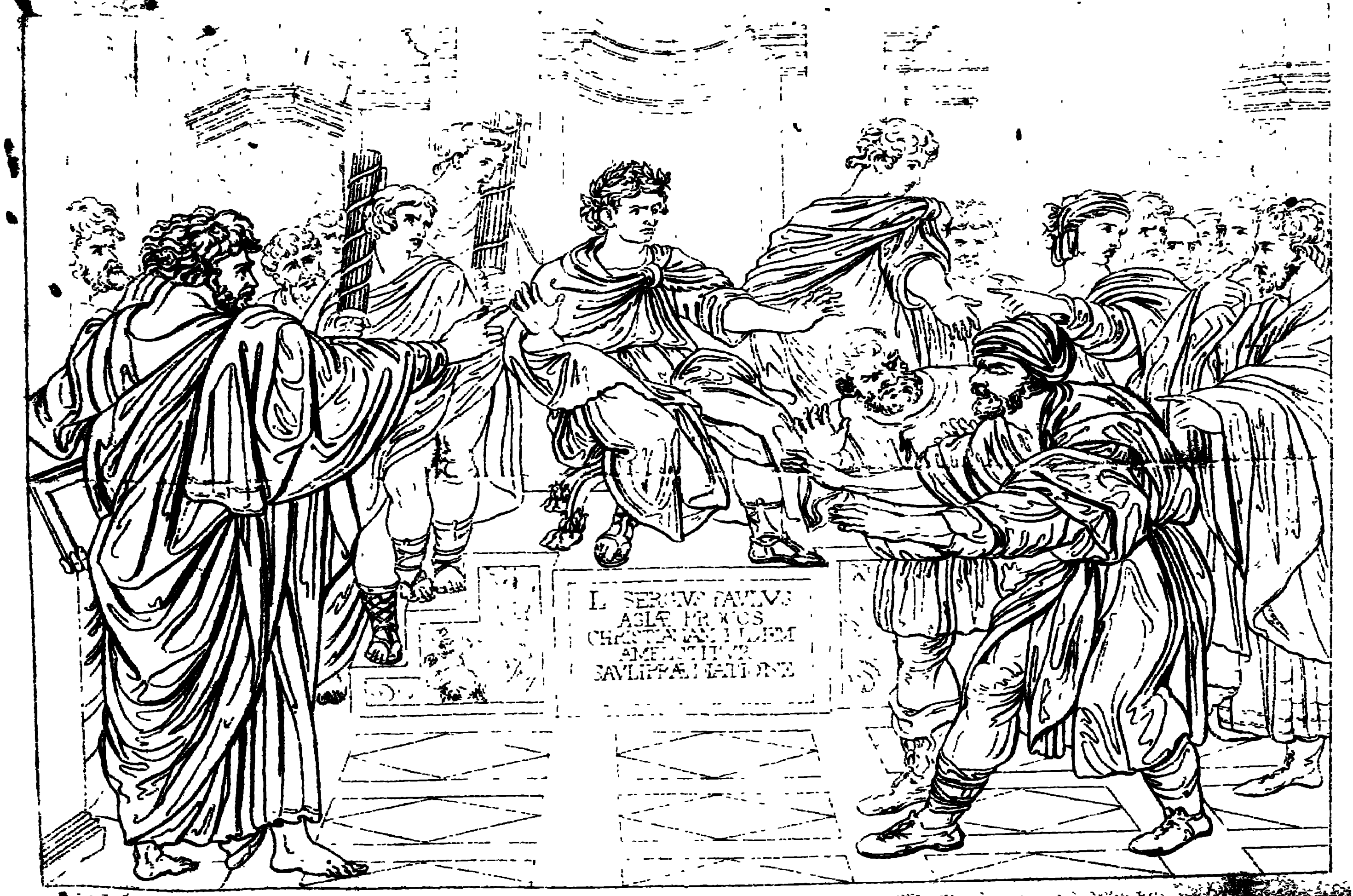

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Fig. 1

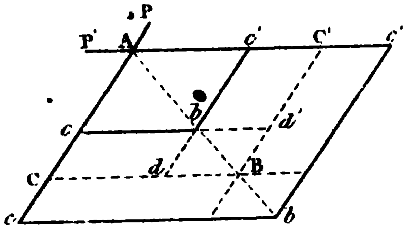


Fig. 2

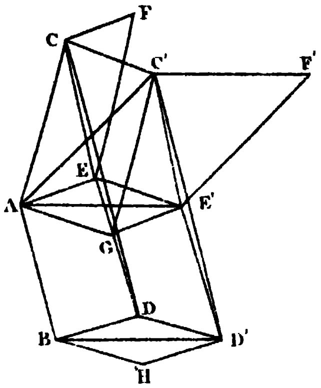


Fig. 3

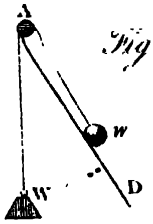
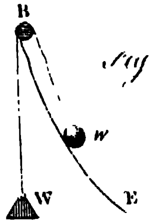


Fig. 4



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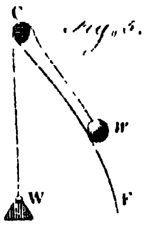

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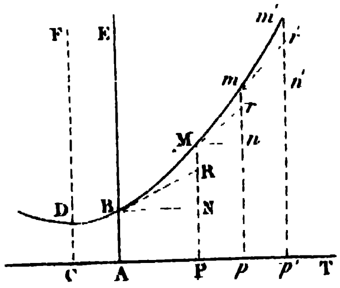

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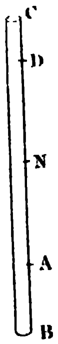

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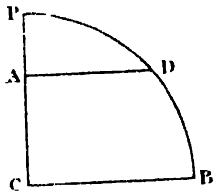

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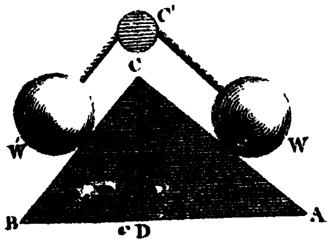

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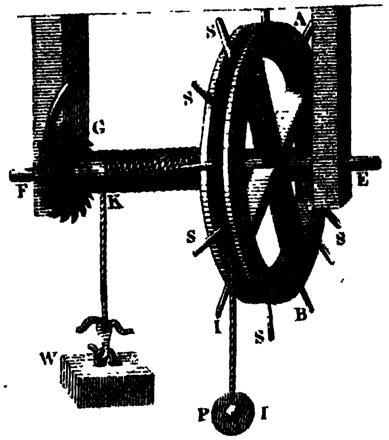


Vidler & Dyball sc.

Published by G. Kearsley Fleet Street Aug. 1st 1800

ELECTRICAL APPARATUS

Electrical Plate Machine

Prime Conductor

Fig 1

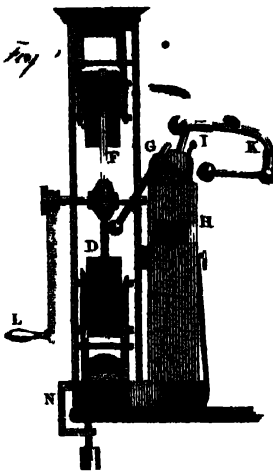


Fig 2

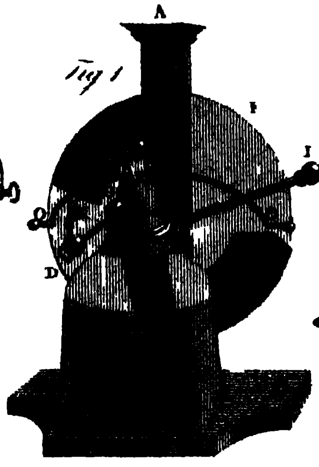


Fig 4
Fig 3

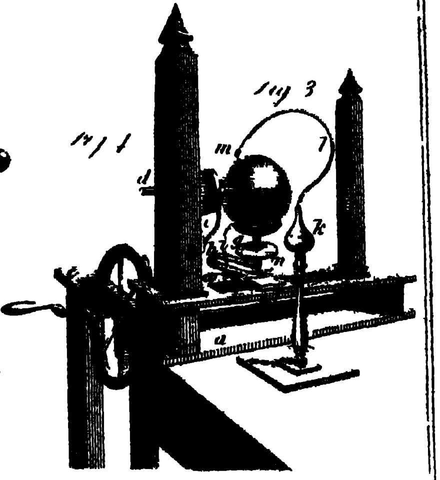


Fig 5

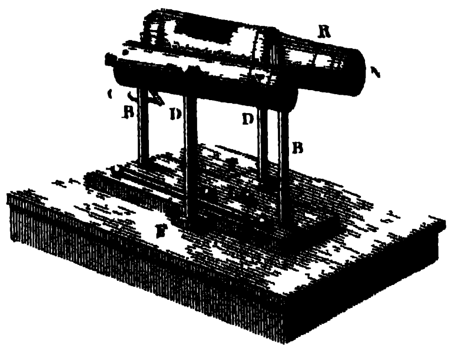


Fig 6

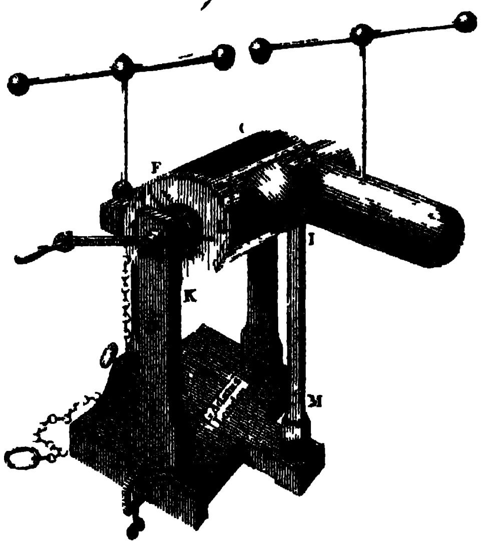


Fig 7

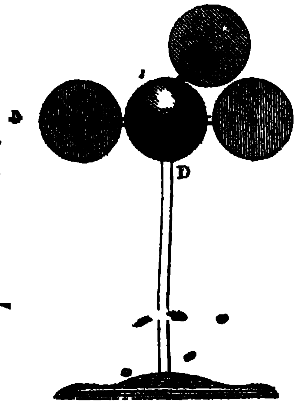
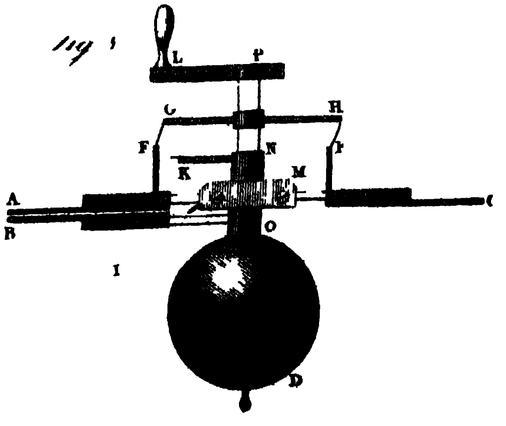


Fig 8



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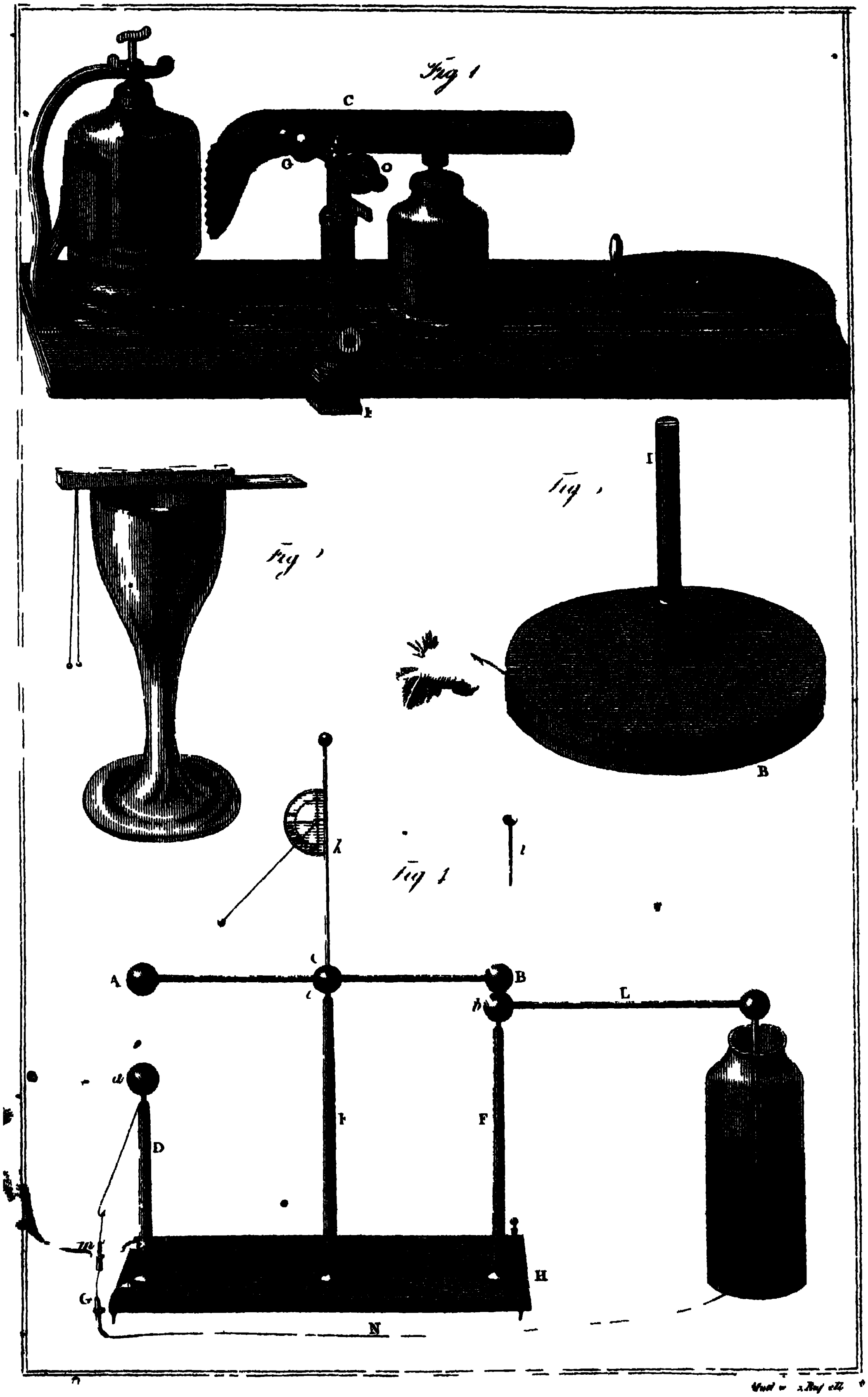
Published by G Kearsley Fleet Street Aug 1 18 9



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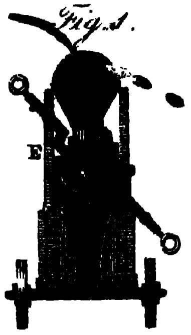
Publish'd by G. Kearsley Fleet street [illegible]

FIRE ENGINES.

Rowntree's Fire Engine.

Fig. 1.



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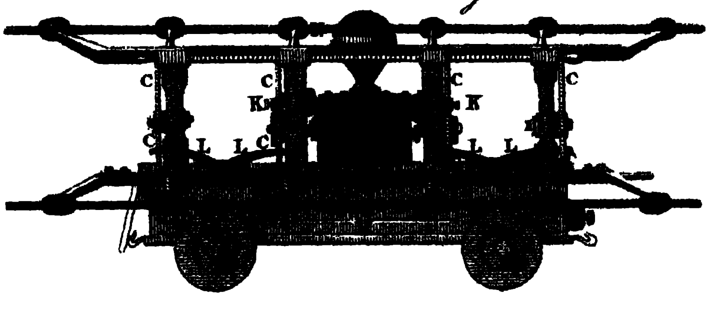

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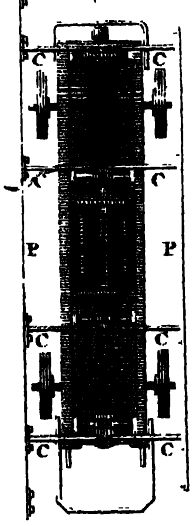

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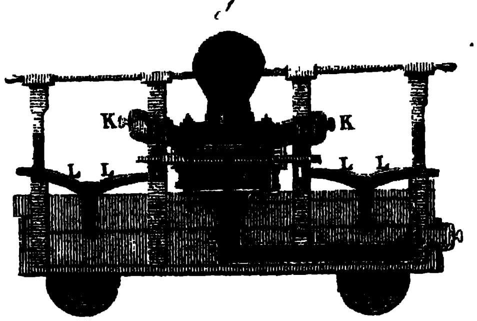


Circulating Fountain.

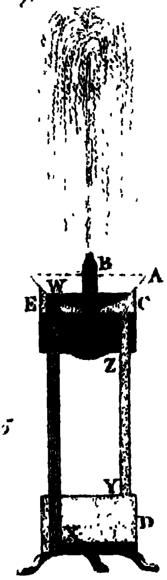


Fig. 5.

American Fire Engine.

Fig. 6.

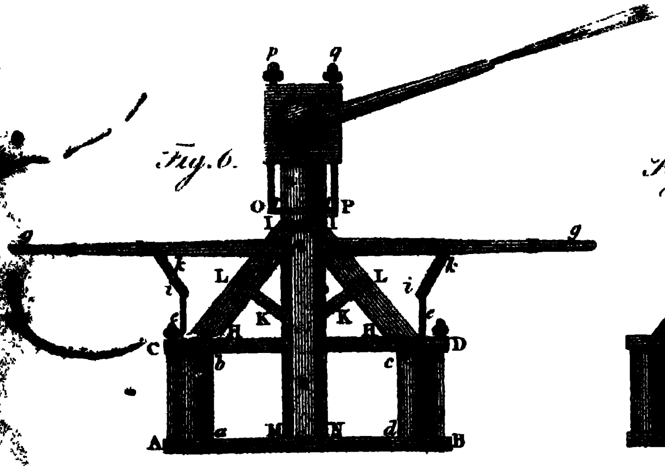
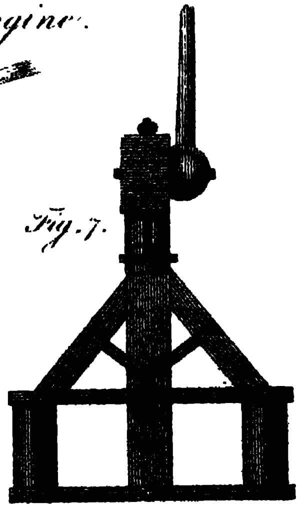


Fig. 7.



Mutlow S. Russell St.

FIRE PLACE.

PL.4

Count Rumford's Improvements.

Fig. 1.

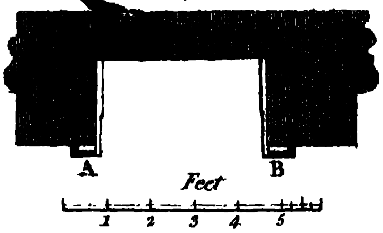


Fig. 5.

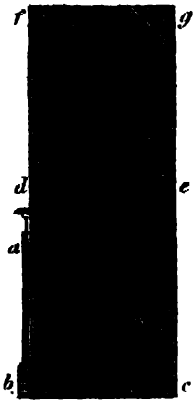
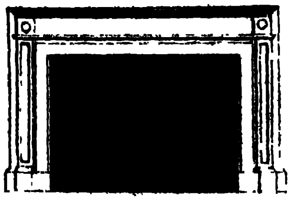


Fig. 2.



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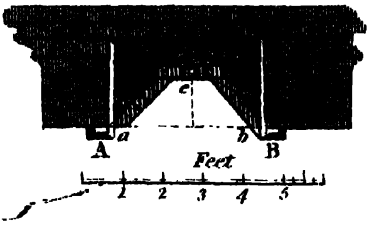

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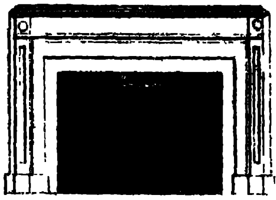

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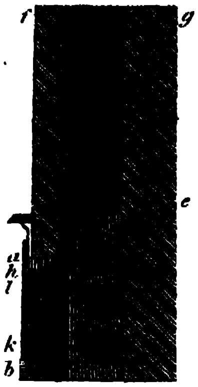

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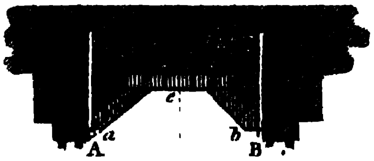

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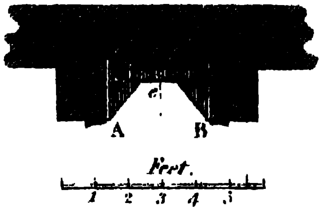


Fig. 10.

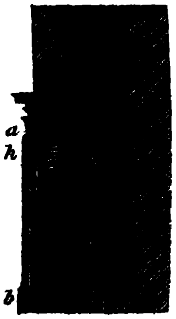


Fig. 11.

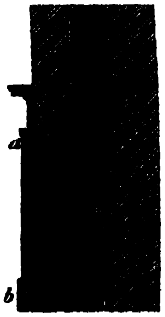
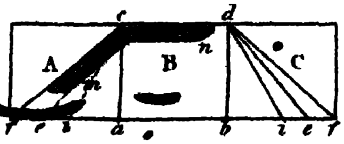


Fig. 9.



Mutlow Sc. Ruſsell Ct.

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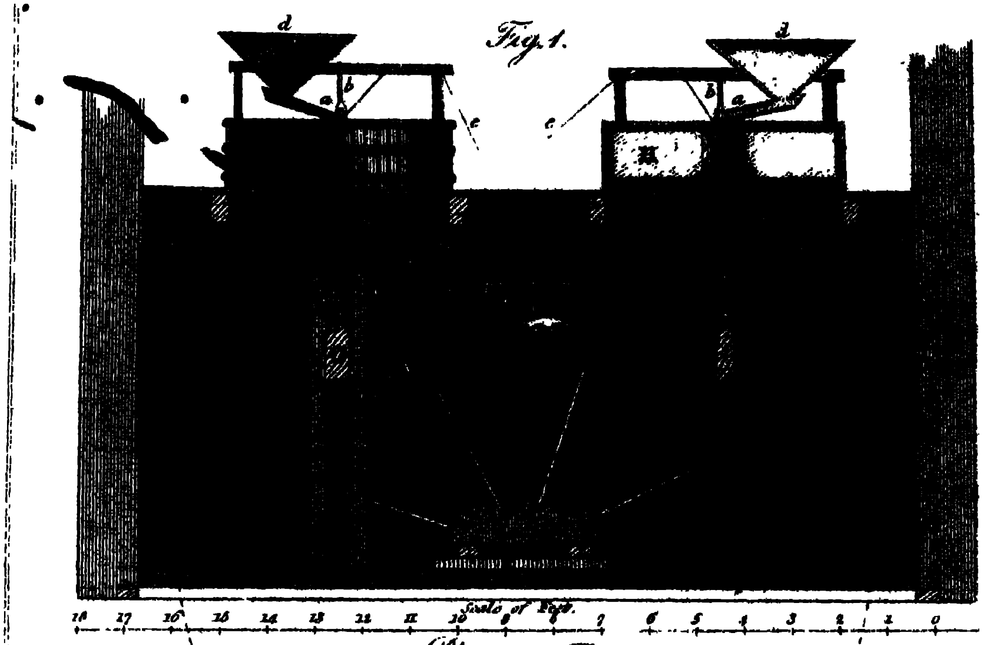
Elevation.

Fig. 1.



Plan. Fig. 2.

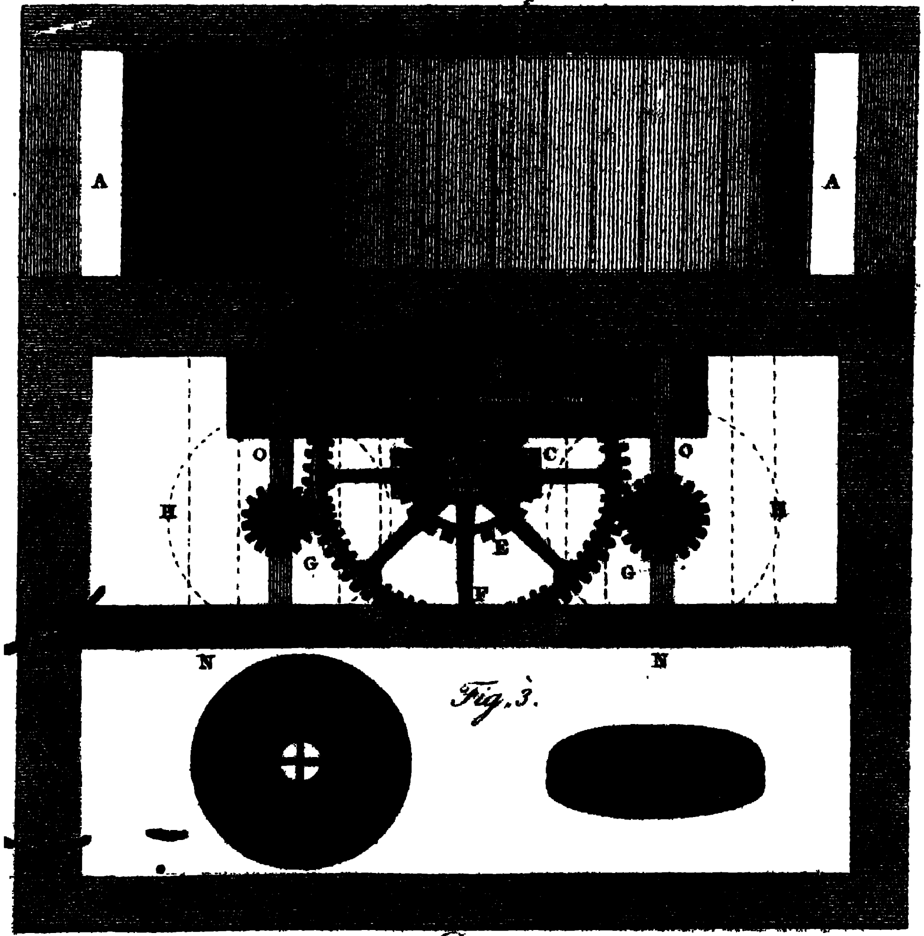


Fig. 3.

Door.

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